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Office Paper Recycling: An Implementation Manual

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This manual is only 1 tool to help and encourage Federal agencies and institutions to recycle. This manual will serve as the cornerstone for implementing recycling in offices, both governmental and private. The primary purpose of this revised manual is to serve as a guide for personnel responsible for the implementation and administration of office paper recovery programs. This guide will take you step-by-step through the process of setting up a high-grade paper recovery program, including assessing your recycling potential, finding a market for your paper and educating employees.

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Office Paper Recycling An Implementation Manual



**OFFICE PAPER RECYCLING:
AN IMPLEMENTATION MANUAL**

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF SOLID WASTE MANAGEMENT
401 M STREET, SW
WASHINGTON, D.C. 20460

January 1990

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FOREWORD

In recent years, the management of municipal solid waste has grown increasingly difficult and complex: Americans produce more and more garbage, yet have fewer and fewer places to put it. In response to these problems, many communities, counties and States are turning to recycling and other creative waste reduction methods to help counter the garbage glut.

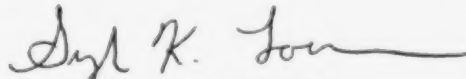
The Federal government has an important role to play in increasing recycling and reduction of waste to meet our national goal of 25 percent reduction and recycling by 1992. In the Environmental Protection Agency's strategy report "The Solid Waste Dilemma: An Agenda for Action," we note that the Federal government should provide incentives, better planning and implementation tools, and most importantly, should participate in all phases of recycling from source separation and collection of recyclable materials to purchasing of recycled products. In many areas of the country, including the District of Columbia, State and local mandatory recycling laws require that government agencies and private organizations recycle.

In keeping with the goals and objectives outlined in the "Agenda for Action," this implementation manual for recycling of office paper is designed to assist Federal agencies in planning, implementing, and promoting a high-grade office paper recovery program. In addition, the basic principles outlined in this manual should be useful to anyone planning an office paper recycling program, including State and local government agencies, commercial businesses and other private organizations. The concepts in this document are grounded in extensive work done by EPA and others in the 1970's, updated by more recent experience and success in the 1980's.

This manual is only one tool to help and encourage Federal agencies and institutions to recycle. EPA's Office of Solid Waste is planning several technical assistance and outreach projects for Federal agency recycling, while EPA's In-house Recycling Workgroup is striving to make EPA a model for other agencies to follow. In addition, EPA is helping other Federal agencies to complete the recycling process by promoting the Federal procurement guidelines for purchase of recycled materials.

We hope that this manual will serve as the cornerstone for implementing recycling in offices, both governmental and private. As shown at EPA, other Federal agencies, and

offices across the United States, recycling of office paper works! We encourage you to use not only this manual, but to consult other sources of information listed at the end of this document to reduce and recycle more of your solid wastes. In order to stem the tide of solid waste problems, to save economic and natural resources, and to meet the important recycling goals of tomorrow, we all share the responsibility to change the "throw-away" ethic and start recycling.

A handwritten signature in cursive script, reading "Sylvia K. Lowrance".

Sylvia K. Lowrance
Director, Office of Solid Waste

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OFFICE PAPER RECOVERY: AN IMPLEMENTATION MANUAL

INTRODUCTION

The Garbage Crisis

The United States faces a growing solid waste disposal problem: rapidly expanding amounts of waste and shrinking landfill disposal capacity. Every day, each of us produces an average of 3.6 pounds of solid waste. Annual generation of waste paper alone by offices, schools, and homes across the country, increased from 12.1 to 18 million tons between 1970 and 1986. In 1987 alone, Americans generated 160 million tons of municipal solid waste, eighty percent of which is now buried in landfills. The waste growth trend will continue; can we afford to let this occur?

By 1991 one third of the nation's landfills will be closed, with few new ones to replace them. The economic and environmental costs of disposing of these increasing volumes of refuse are escalating along with our waste generation rates. In some areas, the dilemma has reached crisis proportions where tons of waste must be shipped hundreds of miles to scarce landfills at costs of up to \$130 per ton.

The Solution

Federal, state and local officials have to seek new, creative waste management practices, including waste reduction and recycling (including composting). Only about 10 percent of the nation's volume of

solid waste is currently recycled or reused, far below what it could be. For the nation, the U.S. Environmental Protection Agency (EPA) has established a goal of 25 percent reduction and recycling of municipal solid waste by 1992. This goal recognizes the many advantages to increased solid waste recycling: reduction of waste volumes otherwise destined for the landfill, reduction of costs, productive use of waste materials, and conservation of landfill disposal capacity. In addition, manufacture of products from recycled materials generally consumes, less energy, water, and other natural resources such as trees. For example, manufacturing paper products using recycled fibers consumes 50 to 60^a percent less energy than when using virgin fibers, and approximately one ton of recovered paper replaces 17 southern pines or three tons of wood pulp. Clearly, recycling is the best possible solution and the easiest to implement.

Why Recycle Paper?

Paper waste is a logical target for increased recycling for two reasons. First, it represents such a large percentage of municipal solid waste - an estimated 41 percent (Exhibit 1). Of this 41 percent, newsprint and paper packaging

^a New York Legislative Commission on Solid Waste Management: The Economics of Recycling Municipal Waste; 1986.



EXHIBIT 1

Paper makes up an average 41 percent of the waste stream, but in offices the percentage may be as high as 90 percent. That's why paper is a major recycling target.

(corrugated) are the principal components and recycling of these waste products is fairly common. The waste paper from government and commercial office buildings is also a natural target for recycling, but recycling has yet to become a common practice. The largest waste component in offices is high-grade white paper (bond, copy paper, and computer paper). Fortunately, this grade of paper is recyclable and can be profitable. EPA surveys conducted in the 1970s indicate that a well-run recycling program can reduce the volume of office waste as much as 75 percent, generate income and help ease the pressure on our nation's landfills.

Second, successful recycling of high-grade office paper can readily be

accomplished. It has already been successfully demonstrated at many locations, including local, county, and state agencies (CA, NJ, RI, and others), some Federal agencies, and private corporations (such as AT&T and Levi Strauss). When correctly implemented, an office paper recovery program will:

- Slash waste disposal costs by reducing the volume of waste collected and delivered to the landfill.
- Earn revenues from the sale of high-grade paper; paper brokers and mills will pay good prices for high-grade wastepaper because of its short supply and usefulness in manufacturing new products.
- Divert large portions of waste from nearly full landfills that otherwise would occupy scarce landfill space. One ton of recovered paper saves 3.3 cubic yards of landfill space.
- Stimulate a growing market for recyclable paper by providing a constant supply of high quality fiber to the paper industry; paper mills use high grades of wastepaper as a substitute for woodpulp.
- Conserve forest lands and other valuable resources. As stated earlier, less energy and water is required to produce paper from wastepaper than from virgin pulp.
- Decrease emissions harmful to the environment. The recycling process reduces air, water, and land pollution when compared to manufacturing using virgin materials.

- Project a good public image of the office workers and their organization as responsible citizens concerned about the environment.

Recognizing the value of waste paper recycling and the success of office paper recovery programs, EPA developed the "Use it Again, Sam" program in the 1970s to promote high-grade office paper recovery in the Federal government (see Exhibit 2). As part of this early program, EPA published a number of technical documents and promotional materials and published Materials Recovery Guidelines for Source Separation, 40 CFR Part 246. (See reference list and Appendix A for further information).

These publications provided assistance to Federal and commercial offices on how to recover high-grade paper from the waste stream prior to disposal.

Why This Manual?

This manual is a revision of EPA's 1977 guide to office paper recovery. EPA decided to revise this manual to stimulate increased recycling of office paper by government, institutions, and commercial businesses. The primary purpose of this revised manual is to serve as a guide for personnel responsible for the implementation and administration of office paper recovery programs.¹ This guide will take you step by step through the process of setting up a high-grade paper recovery program, including assessing your recycling potential, finding a market for your paper, and educating employees. A case study of EPA's recovery program is also included to show how one program has become a success.

The guide is directly applicable to recycling coordinators in Federal institutions and agencies, since the assistance role of the General Services Administration is explained in some detail and Federal regulations and policies are discussed. In addition, however, those wishing to set up recycling programs in state and local governments, as well as private offices and organizations, will find this manual a useful tool for development of an office paper recovery program.

1 EPA and GSA are working together to provide other assistance on recycling to Federal agencies including high-grade paper and other recyclables such as beverage containers, newspapers, and corrugated materials.



EXHIBIT 2

In 1976 this poster was displayed at EPA headquarters to announce the commencement of the office paper recycling program.

CONSIDERING OFFICE PAPER RECOVERY

Why Recycle in Your Offices?

Good reasons to recycle in your office are as plentiful as the paper! Recycling high-grade paper can save money through avoided disposal costs, earn money through the paper sales revenues, and conserve landfill space, energy, and natural resources. Yes, it takes time and some resources to set up and operate an office paper recovery program, but experience has shown that they work! Recycling programs can build camaraderie among employees, and foster good relations with the surrounding community. Finally, recycling can instill workers with a sense of pride in doing something for the environment.

If these reasons aren't enough, local, state, and Federal regulations often require institutions, Federal agencies, and businesses to separate and collect recyclables such as high-grade paper. For example, at the Federal level, Title 40, Part 246 of the Code of Federal Regulations states that *"high-grade paper generated by office facilities of over 100 office workers shall be separated at the source of generation, separately collected, and sold for the purposes of recycling"* (see Appendix A for more information).

In addition to these Federal requirements, state and local laws may require offices to recycle. As of October 1989, eleven states and the District of Columbia passed mandatory recycling laws which focus on residential recycling, but also recommend

or require recycling in offices and government agencies. But for whatever reason: the law, the profits or the environment, recycling makes sense for almost any office.

Can An Office Recycling Program be Economically Successful?

After considering the reasons (and often, requirements) listed above for implementing a recycling program, you may ask, whether such a program can be economically successful.

The answer is yes, but many factors are involved and must be carefully considered. For an office paper recovery program to be economically successful:

- Quantities of high-grade paper present in the waste stream must be large enough to justify its separation and reuse.
- Money saved from avoided disposal costs and earned from the sale of the waste paper should balance the costs of operation.
- The paper should be in demand (marketable) by industry, thereby warranting long-term purchase contracts.
- A proven cost-effective method of separation at the source must be available.

EPA studies show that office waste streams are made up of various grades of

paper. High-grade paper consists of white ledger (bond and copy paper) and computer printout (white or colored striped and perforated form papers used in continuous feed computer printers). Other grades of paper present in the office building waste stream include newsprint, colored ledger, kraft paper, corrugated and other paper board, and coated paper products. The high-grades command a higher market price, have a more stable market demand, and are available in larger quantities than other grades of office paper. High-grades may comprise from 30 to 75 percent of an office's waste stream. Metals, glass, and other materials commonly found in residential and commercial waste streams are found in minimal amounts in office waste. For these reasons, most office paper recovery programs nationwide target the

high-grade fraction so that, with careful planning economic success is likely to occur. Even if an office institutes a multi-material recycling program, including low grades of paper, newspaper and beverage containers, the valuable high-grade paper should be kept separate (not mixed with other paper grades).

Office paper recovery programs are based on the principle of source separation. Source separation is defined as the setting aside by the user of recyclable materials at the point of generation. Exhibit 3 outlines the entire office paper recycling routine. An efficient yet simple system integrated within the daily office routine can push participation rates higher. Several methods have been used for separating and collecting recyclable high-grade waste paper from office

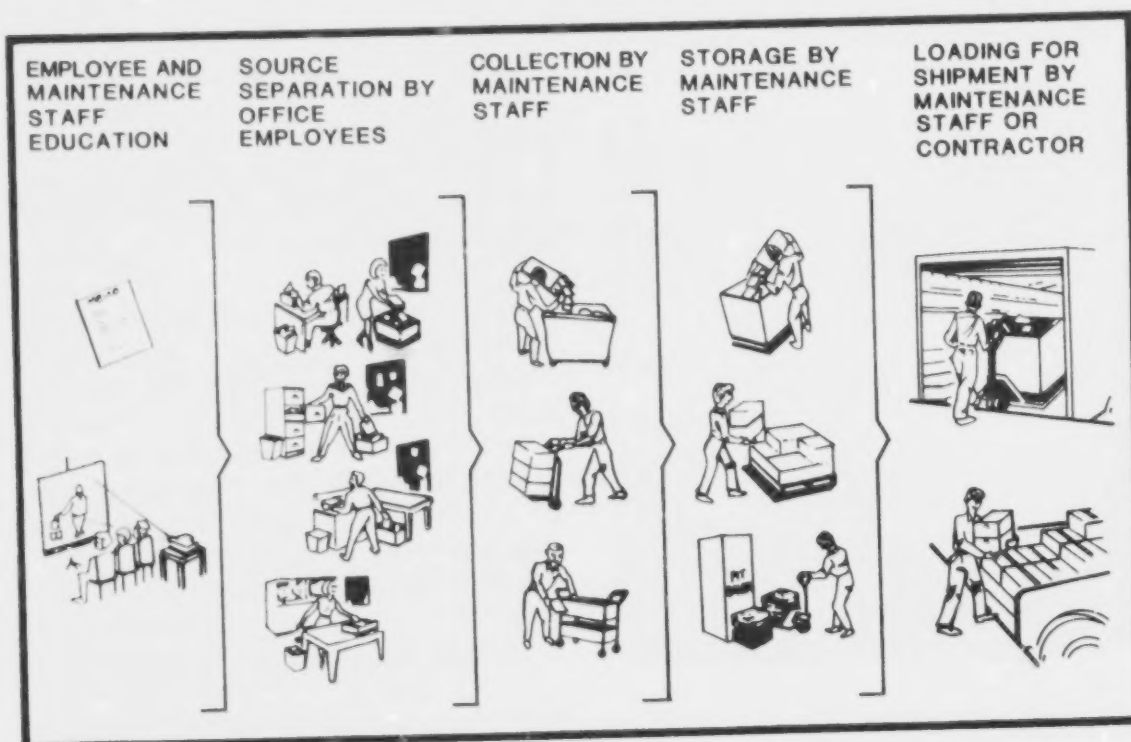


EXHIBIT 3
Outline of the office paper recycling routine.

buildings. In several case studies conducted in the 1970s, EPA evaluated three source separation methods in various locations: dual wastebaskets, central containers, and desk-top systems.

Source Separation Methods

Under the **dual wastebasket system**, each employee is provided with two waste cans or wastebaskets - one for recyclable paper, and one for non-recycled wastes as shown in Exhibit 4. The building custodial staff collects the contents of each basket independently or simultaneously, and the recyclables are kept separate. The collection frequency (ie. daily, weekly, etc.) will depend on the average paper use by employees.

Under the **central container system** (Exhibit 5), separated recyclable paper is carried by each employee to one of the large central containers located through-



EXHIBIT 4

The "two-basket" system has each basket clearly marked for the kind of waste accepted to avoid mixing by employees or collection staff.

out the office. Often, this method is appropriate in smaller offices or office buildings where the custodial staff cannot be used for the desk-to-desk collection of recyclables, or when only a limited recycling program is to be established (for instance, only at the copying machine). All other solid waste is placed in wastebaskets and handled separately.

The **desk-top system** is a refinement of the central container system. Under this system, each employee places all high-grade waste paper in a small container located on or near his or her desk as illustrated in Exhibit 6. Non-recyclable waste is deposited in wastebaskets as before. When the container is filled (Exhibit 7), the employee deposits the accumulated waste paper in a central container conveniently located in the office (each central container should serve no more than 50 persons). Appropriate central locations include clerical stations, elevator lobbies, mail rooms, copying areas, computer rooms, and print shops. The paper is collected from the central containers by the trained custodial or contractor staff.

While not generally recommended, a few commercial organizations have used unskilled workers to collect the recycled paper from each desk-top container, rather than relying on actions to be taken by each employee. This method probably is most effective in larger office complexes, but will likely increase overall collection costs, contamination rates, and inadvertent removal of important documents or papers from the desk. At any rate, one of the three suggested methods should be effective if suitably tailored for any office's unique situation.

Which Paper is Recyclable?

White or natural-colored high-grade waste paper products acceptable under most source-separation recovery programs are:

- White typing, writing, photocopy (xerographic), letterhead, and scratch paper.
- Computer printout paper (white bond and color striped).
- Index cards.
- Tabulating cards.

Items generally unacceptable in a high grade office paper recycling program are:

- Colored "sticky" note slips (with a strip of adhesive on the back).
- Envelopes with plastic windows.
- Carbon paper and other sensitized paper.
- Colored paper.
- Newspapers, magazines, books, and glossy or slick paper.
- Cardboard or chipboard.
- File folders.
- Chemically coated paper, gummed labels, adhesives, tablet bindings.
- Blueprint paper.
- Film, photographs, or scotch tape.
- Rubber bands, plastics.
- Facsimile Machine (FAX) paper.
- Paper and cups with food contamination.



EXHIBIT 5

Central containers usually consist of plastic or cardboard. They should be appealing and clearly labeled. Often baffle lids are required to comply with fire codes and some have slit-type lids to discourage disposal of food in containers.

The Desktop System

EPA studies indicate that the desk-top container system is effective in "skimming" a specified grade of recyclable paper from the office waste stream. The desk-top system surpasses the other two systems in employee participation, the value and percentage of the waste stream recovered, and in minimizing the amount of contamination found in the recycling containers.

There are several reasons for this favorable performance:

- Use of the small, accessible, desk-top container quickly becomes habitual. The containers are visible and thereby yield good participation rates. Employee productivity is unchanged and

paper can be stored in desk-top containers for extended periods of time before quantities must be emptied.

- Contaminants such as apple cores and soda bottles cannot be placed in most containers. Colored paper is easily spotted if it is inadvertently included.
- Each employee "volunteers" the minimal labor of transferring the accumulated paper from his or her desk-top container to the central collection container. This reduces waste and recycling collection costs.

This manual outlines procedures for implementing various types of high-grade paper source separation programs. Other methods are feasible and may be preferred, depending on office layouts, employee preferences, available space to conduct collection, and cost con-



EXHIBIT 6

The cardboard file folder pictured here is for desk waste. Easy to use and clearly marked with the program's logo and phone number, it's highly visible and gets everyone personally involved. The box has a wide enough base to stay upright when placed on the floor to reduce employee desk clutter.

siderations. However, this manual emphasizes the use of the desk-top recovery method as a good approach to avoid excessive contamination of the recyclables and to maintain high participation rates of the office building employees.

The remainder of this manual is organized into three sections:

- The first section addresses administrative requirements during program planning and implementation. It includes designation of a program coordinator, considerations for a feasibility study, establishment of sales contracts, development of collection and storage systems, employee publicity and education campaigns, and program maintenance.
- The second section discusses the economics of recovery programs. It is useful to assess the economics of an office paper recovery program prior to program planning and initiation. This section addresses how to assess the reduced disposal costs (due to the reduced volume of the waste stream), the quantity and value of the recovered paper, and the costs associated with establishing and operating a successful program.
- The final section of this manual describes a high-grade waste paper recovery program for the EPA headquarters in Washington, D.C. The case study traces the development of EPA's recovery program from the initiation of the "Use it Again, Sam" program in

1975 to the recent success of the program developed by EPA's in-house Recycling Work Group, which was established in 1988.

Appendices to this manual are provided as references that may be helpful in program planning. Included are EPA guidelines for source separation and recovery¹ (40 CFR Part 246), a list of GSA contacts for each region of the country², a sample waste composition study³, and definitions of paper grades.⁴

1. 40 CFR Part 246

2. Provided by General Services Administration, Region 3, Federal Supply Service Bureau, Washington, D.C.

3. SCS Engineers, Reston, VA. Based on data from waste composition studies.

4. Paper Stock Standards and Practices, Circular PS-88, published by the Paper Stock Institute of America, National Association on Recycling Industries, Inc.



EXHIBIT 7

An employee empties her own collection container full of recyclable paper into a centrally located container adjacent to a copy machine. This method decreases labor requirements because all the recyclable waste has been separated at the source and concentrated in several locations.

PLANNING, IMPLEMENTATION, AND OPERATION

Besides committed individual employee enthusiasm and participation, successful high-grade office paper recovery programs that use the desk-top system, have several key elements in common:

- An enthusiastic and knowledgeable program coordinator.
- A secure market for the recovered paper.
- A simple and reliable collection and storage system.
- An effective employee education and publicity campaign.
- A reliable method of continued program administration.
- Strong visible support from management.

The procedures discussed below will help establish a successful program with these key elements in place. Exhibit 8 presents a flow chart of the major activities that will be discussed.

DESIGNATING A PROGRAM COORDINATOR

No program can be successful if people don't join in. Yet participation isn't enough. Each office paper recovery program needs a program coordinator to administer the planning, implementation, and operation of the program and to act as a liaison among upper management, building managers, maintenance supervisors, employees, and sales contractors. Good program coordination is crucial to

the success of the recycling program. As such, it should be an official function, not a volunteer duty to do in one's spare time. Planning and organizational talent, coupled with enthusiasm and an ability to communicate with others, are qualities sought in the program coordinator. Ideally, his/her interest areas should include cost and waste reduction and environmental control. Personnel at the administrative level who are eager to become recycling specialists and use their abilities are possible choices for coordination work.

In most cases, one person is assigned or requests to be the program coordinator. However, in large buildings, or when one individual does not have sufficient time to perform the task, more than one person may be assigned on a part-time or full-time basis. Having more than one coordinator assures that someone always will be available to oversee the program.

In multi-tenant office buildings, the program coordinator should be selected from the organization with the largest number of employees housed within the facility. One person from each tenant organization should be designated to oversee his/her organizational program, assist the program coordinator in scheduling education sessions, and perform other program implementation activities.

The duties and responsibilities that accompany the operation of the waste paper recovery program may require the program coordinator(s) to perform the

following:

- Establish a waste paper sales contract or access an existing contract.
- Renegotiate a disposal service contract.
- Develop and implement the collection and storage system.
- Conduct the employee publicity and education campaign.
- Continue program operation.

Some of these tasks may be similar to those for which other personnel are currently responsible. Part of the program coordinator's role will be to work closely with personnel responsible for these duties to implement the waste paper recovery program.

The administrative requirements for these activities are significant during program start-up (often the first 3 to 4 months), but tend to decrease after the program is underway. Case studies indicate the importance of initial administrative and educational activities in maximizing employee education and participation and in minimizing contamination levels. EPA's experience suggests that the tendency is to under-estimate the administrative time requirements associated with the implementation and operation of paper recovery programs. While time required to coordinate a program will vary depending upon the size of the organization, the configuration of the building, and the services provided by either existing administrative functions or the paper sales contractor, a full-time recycling coordinator or consultant usually is necessary for the first 3 to 4 months.

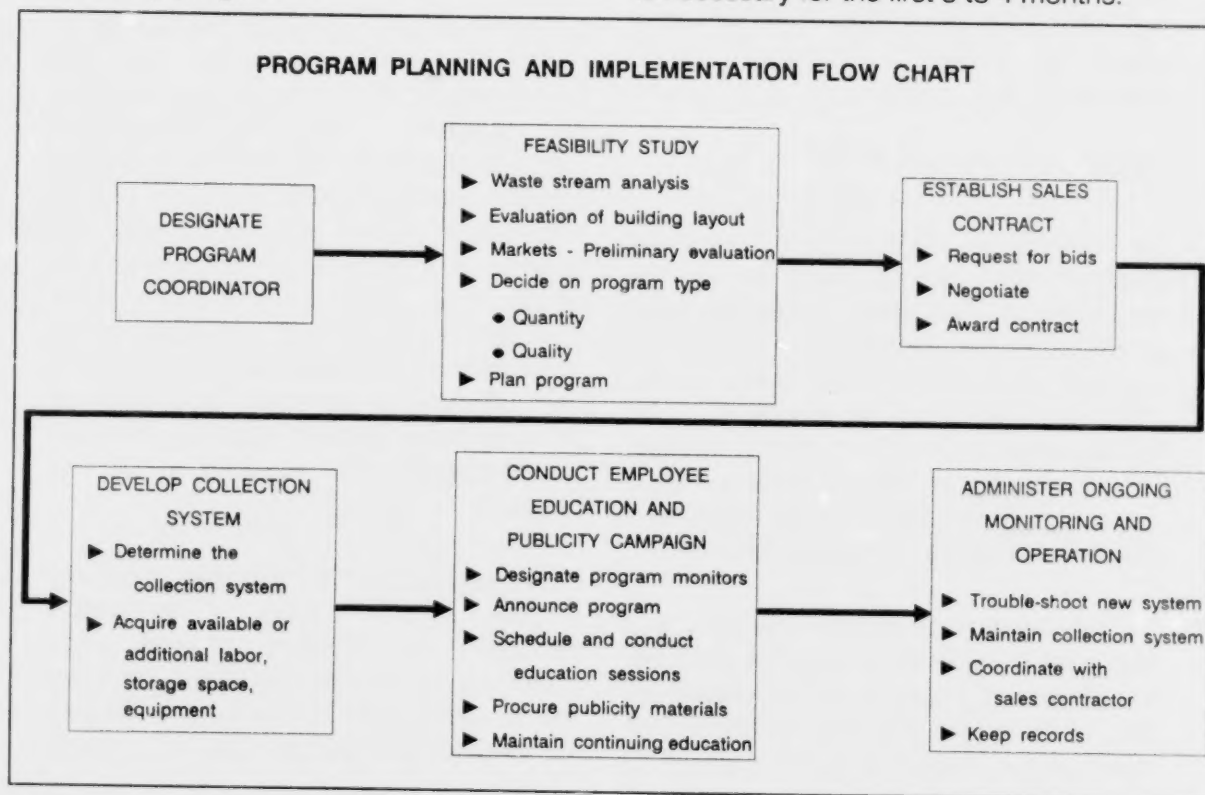


EXHIBIT 8

The program coordinator should designate **program monitors** to assist with various portions of the recycling program such as overseeing the collection containers, screening for contaminants, encouraging employees to participate in the program, and answering questions from fellow workers. Program monitors should have a good rapport with the staff and a thorough understanding of the program's objectives. One monitor per department or for every 50 to 100 employees is recommended, depending on organizational structure, office layout, the receptiveness of the employees, and other considerations. These leadership roles are usually assigned by management as an additional task to current employees as an honor (and it should receive periodic recognition). Typically, their time is not tracked as a labor charge to the program. (Revenues from the recovery program can in some cases be donated to employee fringe benefits as an incentive.)

FEASIBILITY STUDY

To initiate an office paper recovery program, a feasibility study should be conducted for the facility. The feasibility study generates information and data for the design of the program; it evaluates the most practical types of programs to be implemented; it identifies potential markets for recycled paper; and in some areas, it satisfies the requirements for programs mandated by state or local governments.

To determine a program's feasibility and obtain information for contract negotiation, the grades of paper to be separated out (i.e., white ledger or computer printout or mixed white ledger) and the amount of

those grades to be segregated must be identified. These data affect the sizes and types of collection containers, the price paid for waste paper (by dictating the number of pickups based upon the contractor's minimum pickup requirement) and the available storage space at the loading dock. Larger pickups often receive a higher unit price for waste paper.

There are three ways to obtain this information: assume generation rates based upon generalized statistics, (e.g., 0.5 lbs. white ledger/employee/day); conduct a one- or two-week waste stream analysis, whereby representative samples of the facility's wastes are manually sorted and weighed by grade description; or conduct a pilot-scale program, whereby a portion of the facility's employees participate in a recovery program over a period of several weeks for the grades of paper intended for recovery and the segregated grades of paper are collected and weighed. The first method of calculating amounts based on a formula is a "tried and true" method that is usually remarkably close to what can be collected. The waste-stream analysis is usually time consuming and costly, while the pilot-scale program requires good organization. The latter two methods can help produce an accurate breakdown of different paper grades which is beneficial to evaluating the economics of the program.

Other suggestions for program feasibility studies include using a phased-in approach for recovery of high-grade paper (e.g., first in computer or copy rooms rather than in employee's offices) to identify the paper load in central

containers and the storage space necessary for such high volume sources of paper. Additional information that is useful for the feasibility study is an assessment of the building layout, availability of central container and loading dock storage space, and locations for central collection facilities. Once the feasibility study is completed and interpreted, the next step is finding a market to sell the collected waste.

MARKET ANALYSIS

Every good recycling program needs a market analysis of the demand for recyclables. In office paper recovery programs, unlike residential programs, a market analysis for high-grade paper is straight-forward. High-grade paper is a valuable commodity, so the program coordinator rarely has to search hard to find a market. However, the program coordinator will need to assess the quality and quantity of paper that different waste paper buyers will accept, the price that buyers will pay, and the services the buyers will provide. All of these preliminary steps can be done prior to issuing an invitation for bids (discussed in the next section) in order to evaluate what should be collected in the program and to estimate the costs and revenues. The program coordinator may also wish to secure letters from waste paper buyers indicating their interest and intent to bid on a contract if it were proposed.

For Federal agencies, this market analysis is often even simpler: the General Services Administration (GSA) may have done this analysis and already have a viable sales contract in place.

The market analysis involves making initial contacts with local waste paper dealers. Information that should be obtained from local dealers includes:

- Descriptions and grades of paper handled.
- Acceptable contamination types and levels.
- Container types and sizes provided and equipment, if any, available for use (e.g., compactor, handcarts, forklifts, etc.).
- Minimum quantities per pickup and pickup scheduling procedures.
- Methods for handling confidential or classified materials.
- Prices for high-grade paper.

ESTABLISHING WASTE PAPER SALES CONTRACTS

The GSA (assisting Federal civilian agencies) and the Defense Logistics Agency (DLA) work with program coordinators to manage the waste paper sales contracts. A list of regional GSA contacts is provided in Appendix B. However, some GSA regions do not have waste paper sales contacts. Consequently, program coordinators may have to work with their contracting office, GSA, etc., to negotiate their own waste paper sales contract. Additionally, Federal offices with large volumes of waste paper may find it effective to contract separately from GSA for their waste paper sales, even if GSA has an existing sales contract in place. To do this, however, the contracting officer should have a thorough knowledge of the Federal Property Management Regulations (FPMR) as they

apply to sales, and any other pertinent regulations. Thus, most Federal agencies should use the GSA services where possible to establish and maintain a specific contract for waste paper sales.

The first step to establishing a sales contract is to solicit more detailed information from local buyers and brokers. This information includes the following:

- Pricing mechanism (i.e., flat fee, floating price or periodic adjustment of price) and term of contracts awarded (e.g., one year).
- Conservative unit price or minimum price expected over the next year for the high-grade paper that will be separated (e.g., white ledger, computer printout, etc.).
- References of current sales contracts with facilities to assess the reliability and flexibility of the dealer, particularly with regard to contaminated loads.
- Letter of Intent to Bid.

Invitation for Bids

The major elements of Invitation for Bids (IFB) are:

- Description and grade of waste paper to be sold with allowable contaminant loadings.
- Estimated generation rates.
- Location(s) of paper pickups.
- Minimum pickup quantities and method of scheduling pickups.
- Containers and equipment provided by the contractor.

- Confidential document destruction procedures, if applicable.
- Performance penalties.
- Pricing mechanism and term of contract.

Waste paper grades may be defined as in Paper Stock Standards and Practices PS-88 (Appendix D) which is an industry standard or they may be set by individual dealers based upon the businesses to which they sell the waste paper (e.g., tissue mill, etc.). Exhibit 9 is an example of the 1989 GSA sales contract for the Washington, D.C. area and specifies a high, medium, low grade classification. These grades allow for the contractor to purchase paper containing certain levels of contaminants at a lower price. Note that this classification was defined by GSA on this one contract to facilitate collection and grading of the material. It is not an industry standard.

Development of Contract

The estimated recovery rate for each grade segregated should be specified in the IFB so the contractor can estimate overall quantities and associated prices to be paid under the contract.

The location of the paper pickup(s) including loading docks or one or more buildings must be specified in the IFB along with the option for the bidders to inspect the area(s) prior to submitting their bids.

The method of handling confidential or classified materials must be specified in the IFB. These materials must be shredded, macerated, pulped or burned

Grade 1: Computer printout, white ledger, hard white shavings, and manila tabulating cards or any combination thereof.
No more than 1% total outthrows or prohibitive materials by weight.

Grade 2: Miscellaneous ledger and contaminated Grade 1 paper or any combination thereof.
No less than 1% and no more than 3% total outthrows or prohibitive materials by weight.

Grade 3: Various grades of paper, including carbon interleaf, file stock, wet strength, corrugated containers, heavy books, and contaminated Grade 2 paper or any combination thereof.
No less than 3% and no more than 10% total outthrows or prohibitive materials by weight.

Acceptable contaminants include paper clips, staples, and soluble glues (i.e., bond envelope glue).

Unacceptable contaminants include pressure-sensitive labels and tapes, plastic window envelopes, rubberbands, brown/golden kraft envelopes, binders (i.e., pressboard, plastic, and cloth covered), paper fasteners, binder clips, plastic materials, and carbon paper.

Prohibitive materials: a) Any materials which by their presence in a packing of paper stock, in excess of the amount allowed, will make the packing unusable as the grade specified. b) Any materials that may be damaging to equipment.

Outthrows: Outthrows shall be understood to be all papers that are so manufactured or treated or are in such form as to be unsuitable for consumption as the grade specified.

EXHIBIT 2

1989 GSA Paper Grade Specifications for Washington, D.C.



EXHIBIT 10

If the facility generates confidential waste paper it still can be included in the recovery program. Shredding of the confidential waste is common practice and it can be sold to the waste paper dealer prior to or after shredding.

(see Exhibit 10). Shredding may be done by the contractor or may be done by in-house personnel. The contractor can certify that the confidential material is destroyed or in-house personnel may accompany it and supervise its destruction. Be sure to check with the individual contractor as to the organization's specifications regarding confidential materials before the method of disposal is determined.

Specifications in contracts vary among GSA regions and may change annually. Categories that are chosen for contract specifications are dependent on the individual contractor and should reflect the content of the facility's specific waste stream.

Segregation of computer printout from white ledger may be economical, depending on recovered quantities, due to the higher market price. Even when segregating only high-grade paper, a

lower grade should also be specified in the contract to reflect the price to be paid for a contaminated high-grade load.

Minimum pickup quantities must be specified and may be related to the container types provided (e.g., 4 bales, canvas hampers, trays or pallets of 1-5 tons). Scheduling for pickups either for specific days and times or on an on-call basis (e.g., within 48 hours of notification), must be specified.

Containers to be supplied by the waste paper dealer must be specified in the bid along with the storage requirements of each. Some contractors pay a premium for baled paper if a low contamination level is guaranteed. Others prefer that the paper be stored in boxes or bins so that they can scan for contaminants prior to baling. Also equipment such as handcarts, forklifts, balers, shredders, or compactors which need to be supplied by the waste paper dealer should be specified in the contractor's bid.

The method of pricing pickups is based upon the contractor weighing the load. Usually the loaded truck is weighed and the tare weight of the truck plus the containers is subtracted from this weight. In GSA's 1989 contract, a "Waste Paper Delivery Order" form is completed in quadruplicate and signed by both the contractor and the governmental representative. Load weights are reported back to the government on certified scale tickets within two weeks for proper billing. The program coordinator may want to establish pre-set weights in the contract (estimated weight per container) in order to provide "ball park" figures on weights at the time of pickup. It is important that the

office or agency maintain close oversight of the weighing and billing procedures in order to minimize the opportunity for theft or inaccurate weighings.

Important aspects of a waste paper sales contract are the pricing mechanism and the term of the contract. Long-term contracts are preferable but require more flexible pricing mechanisms (i.e., floating prices tied to the market value of the paper) or a periodic revision of the quoted price per ton. A guaranteed minimum floor price should be specified in each case. One year is considered to be the minimum term of a waste paper sales contract. The Washington, D.C. GSA waste paper contract is reissued for bidding on a yearly basis and specifies a flat fee per ton of waste paper for each grade of paper.

The contract elements discussed above apply primarily to waste paper contracts for pickups at loading docks or central storage areas. Other types of contracts include "full service" contracts, whereby the waste paper dealer establishes the facility's entire recovery program including employee education and paper collection and handles all waste paper pickups. The expenses of these other services would be deducted from the value of the paper yielding a lower unit price per ton paid for the paper. While these contracts seem attractive, the contractor needs to be qualified in implementing all aspects of the program. In addition, the contractor may often limit his services to paper pickup at the dock when paper prices drop, leaving the program undirected.

Office paper recovery consultants, independent of waste paper dealers, also

are available to set up a recovery program or at least educate the program coordinator on the mechanics of setting up a program. These consulting services often suggest resources for procuring collection, educational, and publicity materials and may provide educational tools such as slide shows, videos, posters, and other materials. In other words, the information available is vast and the many different ways of devising contracts and methods guarantee finding a program geared to your needs.

RENEGOTIATING DISPOSAL SERVICE CONTRACTS

Depending upon the region of the country where the facility is located, reduced waste disposal fees may be the most significant aspect of the cost-effectiveness of a recovery program. The program coordinator should investigate this in conjunction with the office's contract services staff. Waste disposal contracts usually are based upon one of three cost accounting methods: a flat fee per week, month or year; a fee per "pull" or emptying of the waste storage containers (as well as a fee for renting the containers themselves), or a fee per ton of waste hauled. The first two are the most common in large office buildings. The waste hauler should be contacted to negotiate a reduction in hauling fees by changing the flat fee, the number of containers serviced, and/or the number of pulls needed.

In situations where waste disposal costs may be included in the lease agreement for office space (a common occurrence for Federal agencies), no benefit from avoided disposal costs accrues to the

organization performing the recycling. Negotiations between the organization and the landlord regarding changes in the lease agreement must be undertaken to establish whether savings from reduced disposal costs may be accounted and credited towards the organization's costs for establishing the recycling program.

DEVELOPING AND IMPLEMENTING THE COLLECTION AND STORAGE SYSTEM

Because it gets people involved and minimizes contamination, the desk-top system is emphasized in this manual. The desk-top system requires that employees accumulate paper at their desks and deposit it in central containers at their convenience. The paper is then collected from central containers and consolidated in the main storage area by custodial or general service labor groups within the facility. A simple and reliable system must be developed for collecting and storing the recovered paper. Key components in developing and implementing the collection and storage system include:

- Selecting and distributing easily identifiable desk-top or desk-side containers (including the program's logo and/or motto and instructions for use, as illustrated in Exhibit 11).
- Determining central container locations and selecting and distributing central containers.
- Acquiring and routing collection personnel.
- Considering necessary equipment (storage containers, collection equipment, shredders, etc.).
- Acquiring storage space.



EXHIBIT 11

It is important to show the logo for recycling directly on the desktop container. Acceptable materials are printed on one side, unacceptable (contaminants) on the opposite side.

- Determining methods of collecting and storing confidential wastes.

Selecting and Distributing Desk-Top Containers

Get everybody participating in the program through the distribution of individual containers. A variety of desk-top containers are available commercially through office suppliers and recycling vendors. Sources for locating recycling equipment vendors include magazines and publications such as Resource Recycling, Waste Age, Recycling Today, and the American Recycling Market Annual Directory/Reference Manual, to name a few. Desk-top containers may be available from the waste paper contractor. If, the contractor is changed, however, there is the chance that the facility will be left without equipment (unless it is then purchased from the contractor directly). GSA can supply containers (cardboard

vertical file boxes and central containers with a lid and slit in the top) to Federal agencies through their catalogue and the Customer Supply Center in Washington, D.C. They are in the process of increasing their availability nationwide. Alternatively, contact the office suppliers used for other supplies or vendors of recycling equipment to determine what is available for use as desk-top containers. If the style available does not suit your needs and you need a large quantity, then put a design of your own out for bid.

The desk-top containers may be made of paperboard or plastic and resemble vertical napkin holders, heavy duty vertical file folders, vertical boxes, or horizontal in-boxes. However, the selection of a practical desk-top container depends on the needs and requirements of the specific facility, aesthetic preferences, and budgetary constraints. Vertical containers, illustrated in Exhibit 12, are usually preferred and recommended by EPA because of the large paper capacity and



EXHIBIT 12

On the vertical cardboard desk-top folder labels may be used to identify the purpose of the container and the program.

reduced amount of desk space required when compared to horizontal containers. The container selected should be stable, durable, and require a small amount of desk space.

A consistent desk-top container style and color should be used throughout the paper recovery program. Each container should be clearly labelled or printed identifying the program and listing what can and cannot be recycled. The label also may include the telephone number of the program coordinator so that employees may call in case of questions or problems. Since both employees and collection staff may not speak or read English as their first language, container instructions should be multi-lingual as appropriate.

Desk-top containers are supplied to each employee, usually during program education sessions. At smaller facilities, containers may be distributed to employees at their desks during or after education sessions. Making sure each worker has his/her own container will insure greater participation and, in the long run, greater overall success.

Central Container Location, Selection, and Distribution

No program will work without clear organization -- that is, each participant knowing what to do and where to go. Central containers to serve from 15 to 25 employees (for example in office bay areas) and up to 50 employees (in larger storage areas) should be located throughout the office facility. Locations for each container depend on the available space in the building, local building fire



EXHIBIT 13

This central container measures 5.0 cubic feet. It is made of white double strength cardboard making it both visible and attractive in the office environment. Note that the acceptable and unacceptable materials are printed on the front.

codes, and practical considerations. For example, some fire codes may prohibit the placement of containers in hallways or entrances. If possible, containers should be stationed in locations accessible and visible to both general office employees and collection crews. Central containers should be placed in computer centers, record rooms, reproduction rooms, and other areas where large volumes of paper are generated.

Central containers may vary in size and shape from 1.5-cubic-foot cardboard boxes to 44-gallon rubber or plastic cylindrical containers with swing lids or one-cubic-yard canvas hampers. Exhibits 13 to 16 illustrate various designs and locations used for central containers. When selecting central containers, the amount of paper generated per area and the frequency of collections should be considered. Small table-top containers

may be suitable for general office locations with cramped quarters or low paper generation rates, while larger containers or bins may be necessary in areas with high rates of paper generation, such as photocopy rooms. Each container should have sufficient storage capacity to hold the paper between collections, which may vary from daily to weekly, depending on the program. Fire codes can dictate the choice of central containers. For example, some fire codes may specify the use of covered containers, such as bins with fire baffle lids. These containers can be purchased through custodial suppliers, the recycling contractor or other vendor. Put a design out for bid if the containers available don't suit your needs and a large quantity is desired. Program budgets may play a role in container selection. Programs with available funds will probably purchase permanent containers, such as plastic, rubber or canvas wheeled bins or hampers. Programs with budgetary constraints could use empty copy paper supply boxes, but be sure these boxes are clearly marked as recycled paper containers.

Central containers should be clearly identified using the same color and program logo used on the desk-top containers to avoid being used as trash containers or thrown away themselves. In addition, a list of acceptable or unacceptable items should be posted on or near each container location. If computer and high-grade paper are collected separately, be sure to identify the type of paper that the container is intended to hold (e.g., "Computer Paper Only"). Again, labelling should be multi-lingual, as appropriate for collection staff

and employees who may not have English as their first language.

Some waste paper dealers will provide central collection containers. However, these containers may not work with the desired program theme or given spatial constraints. Regardless of how or where they are arranged, container locations must be obvious and accessible to the individual employee.

Acquiring and Routing Collection Personnel

Paper deposited by employees into the central containers must be consolidated and transferred to the main storage area. Collection personnel perform this task. EPA studies have shown that facilities housing from 100 to 500 employees may use part-time labor to collect recovered paper, while larger facilities (over 2,500 employees) will likely have to allocate the equivalent to eight man-hours a day or a full-time position to perform this task. The amount of paper generated by the facility and the number of collection stations also must be considered to estimate needed collection labor.

The recycling coordinator should make every effort to meet these collection labor needs with existing staff or contract labor in order to minimize program costs. Most programs successfully accomplish recycling collection activities using the existing labor force, including custodial staff, contractors for furniture moving and facility maintenance, etc. Custodial staff or other collection labor must be thoroughly trained and educated about the recycling program and their tasks

(especially to avoid mixing of recyclable paper and trash).

Several options may be available for integrating waste and paper collection activities. Recycled paper and other remaining wastes may be collected simultaneously, each deposited in separate bags or bins on a collection cart and taken to separate storage areas (Exhibit 17). With simultaneous collection, efforts must be made to ensure that the recovered paper is kept separate to prevent contamination. As an alternative, some offices use a rotating collection system in which the custodial staff collect the separated paper and other wastes on alternate nights. Another method, illustrated in Exhibit 18, is to keep recycled paper collection separate from other waste collection altogether. In this situation, one or more members of the



EXHIBIT 14

A large waste basket near a copy machine serves as a receptacle for waste paper. Larger containers are necessary in areas with high paper generation rates such as copy areas or computer printers.



EXHIBIT 15

This recycling program uses separate stacked bins for central collection of various grades of paper. The combination of bins can be adjusted depending on generation rates of each paper type at the collection locations, thus making for a very flexible system.

custodial staff may be assigned to independently collect recyclable paper. Separate paper collection may also be performed by other personnel, such as mailroom, supply distribution, maintenance, general service, or other available service staff. In many cases, contracted maintenance or general service agreements can be renegotiated to include the additional job of paper collection.

When integrating paper collection with existing office routines, consider the number of custodians servicing the building, the nature of their employment (in-house, contract, union), their hourly availability (day or night shift), and other personnel who could perform these

duties. If existing personnel cannot be used to perform the consolidation activities, contracting or hiring some additional labor may become necessary. In addition, many government agencies and private organizations participate in temporary or full-time hiring programs for local high school or college students, minority or under-privileged groups, or the disabled.

Paper collection must be supervised closely to maintain high participation rates. Reliability can be maximized by avoiding labor turnover, particularly in larger programs where familiarity with paper collection points is critical. It is important to maintain communication with collection personnel regarding changes in the program, overflowing central containers, or other key information. For this reason, it may be beneficial to arrange for paper collection operations to be performed during the day, when the program



EXHIBIT 16

A small collection box near a copy machine saves space but likely needs to be serviced each day by the collection crew.

coordinator and program monitors are available to communicate with the collection staff.

Collection personnel must begin servicing central collection containers as soon as the program begins. In large buildings, it may be beneficial to conduct a "dry run" before program implementation and to ensure that each collector has a floor plan showing where central containers are located. In this manner, the collection staff becomes familiar with central container locations and the most practical collection routes. A month of program operation will serve to establish appropriate collection routes, the proper frequency

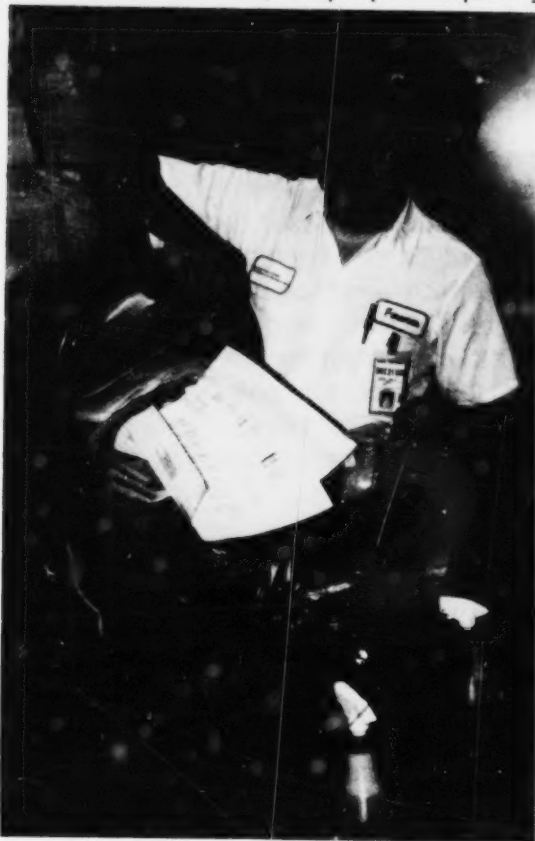


EXHIBIT 17

The custodial staff services both the paper and other waste containers simultaneously. The paper wastes are collected in clear plastic bags and other waste in black plastic bags.

of collections, and any added labor requirements.

Collection Equipment

The collection and movement of recovered office paper can be integrated with other materials handling activities within the facility, such as maintenance, mail and supply distribution, or waste collection. Existing equipment may be available for the collection of office paper. Collection and handling equipment commonly used in office buildings for paper recovery programs includes:

- Wheeled canvas bins or barrels.
- Mail carts.
- Canvas bags.
- Hand carts, dollies or gurneys.
- Forklifts.
- Balers.

If existing equipment is unsuitable or unavailable, leasing of equipment from the waste paper dealer (as part of the contract) or purchase of additional equipment may be necessary. Factors to be considered when purchasing equipment include hallway width, doorway width, type of floor covering, and freight elevator size. Wheeled bins are the most common transport equipment (Exhibit 19). Some programs use 44-gallon containers both to collect and transport the paper similar to that shown in Exhibit 20. When the central collection container is full, it is simply wheeled to the main storage area, emptied, and returned to the floor or replaced with an empty container.



EXHIBIT 18

The paper collection system at this university campus uses student labor to service the collection containers in the buildings. The program has a vehicle used for transporting paper to a storage area.

If paper is stored in pallet boxes, a pallet jack or forklift will be needed to move the full pallets (each pallet will weigh between 1,000 and 1,500 pounds). Collected paper can be baled, particularly in buildings already equipped with a high-speed baler or when a significant premium can be obtained for baled paper (Exhibit 21).

Storage Space

Acquiring storage space is an important step towards development of a paper collection system. The program coordinator can play a major role in working with the building manager and sales contractor to locate and obtain appropriate storage space.

Recovered paper is most often stored in mobile canvas hampers, pallet boxes, or bulk containers. Exhibits 22 and 23 illustrate some methods of storage for

wastepaper. Containers may be provided by the waste paper dealer. Consult with the local waste paper dealer to determine which type of containers can be provided and which would be most suitable for use in the building. Indoor storage is usually in 1.5-cubic-yard mobile canvas hampers or 2.5-cubic-yard pallet boxes. Bulk containers are used when outdoor storage is necessary and may range from 3 to 30 cubic yards.

The amount of storage space needed will be dictated by the quantity of the paper collected, the requirements of the contract and the method of storage. Most contracts require the accumulation of a specified minimum tonnage before pickup. To determine the necessary space, calculate the number of storage containers needed and multiply by the base square footage of each. Table 1 presents rough data necessary to make estimated calculations of needed space.

TABLE 1
Methods of Storage

Container Specifications	Mobile Hampers	Pallets	Bulk Containers
Size	1.5 cu. yds.	2.5 cu. yds.	4 cu. yds.
Capacity	400 lbs.	1,000-1,500 lbs.	2,000 lbs.
Floor space requirements per unit	12 sq. ft.	20 sq. ft.	30 sq. ft.

Keep in mind that additional space may be needed around containers so that they are accessible and conform with fire and safety regulations.

Some sales contracts may stipulate specific collection frequencies or pickup days regardless of paper accumulation. Under this type of provision, the spatial requirements will depend upon the amount of paper generated between pickup days. If the amount of paper produced between pickup days is known, then the storage space requirements can be calculated using the above data by simply multiplying the number of containers needed by the space each requires.

Accumulated paper should be kept as close to the point of pickup as possible, perhaps in the basement or loading dock area of the building. The space should be convenient to the freight elevator and secured to prevent potential contamination, and tampering with or theft of the paper. In addition, the space should meet local fire code requirements, which may include sprinkler protection or other provisions. If space near the loading dock is unavailable, paper may be kept in central containers until the day of pickup

or placed in a temporary storage area and delivered to the loading dock by consolidation staff on the day of pickup. Paper also may be stored outdoors in large bulk containers. If outdoor storage is necessary, the paper must be protected from the elements and secured from theft.

Recycling of Confidential Waste Paper

Many office facilities generate large amounts of confidential or classified materials that are printed on high-grade



EXHIBIT 19

Canvas carts, usually supplied by the paper vendor, can be wheeled to each central container during collection. The lightweight carts facilitate transportation to the storage facility.

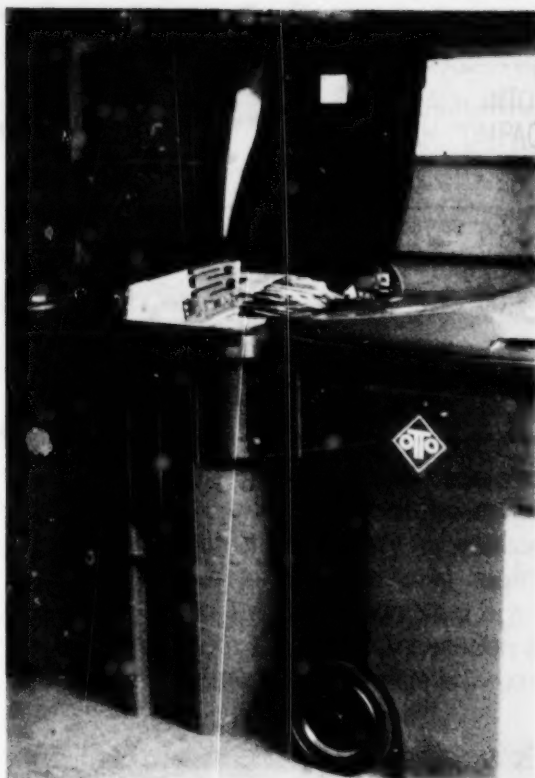


EXHIBIT 20

Plastic wheeled containers are often used for collection and storage. Lids may be required to reduce fire hazards or to protect the contents from the weather if they are stored outside.

recyclable paper. Regulations often require these materials to be incinerated, pulped, or shredded. Recycling of this confidential wastepaper may be possible. The contracted waste paper dealer needs to be contacted to determine if shredded documents are marketable. Management of these special wastes may require separate collection and secure and separate storage of the shredded or unshredded confidential paper. If separate collection and/or storage is necessary, some estimate should be made of the quantity of confidential paper being recycled. Keep in mind that shredded paper takes up more space than flat or crumpled paper.

EMPLOYEE PUBLICITY AND EDUCATION

People are the key to any successful recycling effort. No recycling program can be successful if people don't participate. The success of a source separation program depends upon employee education, awareness, cooperation, enthusiasm and action. Also, the endorsement and commitment of top management to the program will help ensure success and encourage employees to participate. A vigorous education campaign explaining the goals and mechanics of the program is crucial to establishing initial employee participation as well as maintaining that participation over time.

Major elements of the education campaign are:

- Distributing a kick-off memorandum from the top administrator of the organization to all personnel.
- Scheduling and conducting education sessions for management, program monitors, collection staff, and general employees.
- Acquiring and/or developing posters, slide shows, and other publicity materials.
- Conducting ongoing publicity and education before program start-up.

Distributing the Program Kick-Off Memo

The word "Recycle" needs to be spread to each employee, which can be best accomplished with a kick-off memo. The purpose of the kick-off memo is to

demonstrate top-level support and cooperation for the implementation of the paper recovery program. The memo should include:

- Endorsement of the program by top-level management and a clear statement of the organization's goal to reduce waste.
- Environmental and economic benefits of paper recovery.
- Potential for revenues and savings and where they will go.
- Separation and collection procedures and the ease with which they can be incorporated into daily routines.
- Identification of the organization's program coordinator (and program monitors as appropriate).

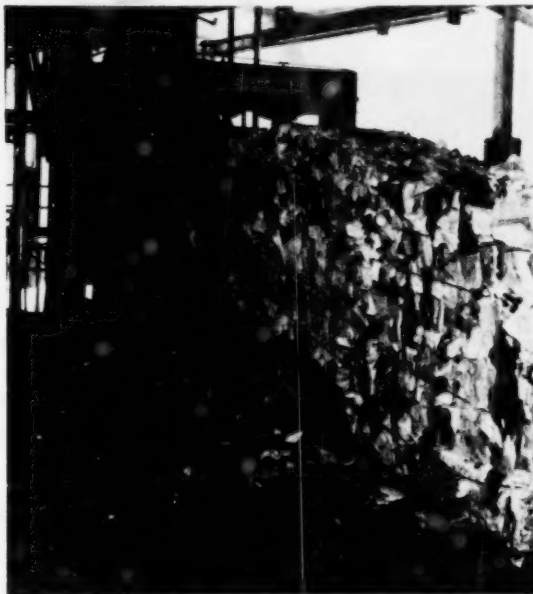


EXHIBIT 21

Baling may be desirable if large quantities of paper are generated by the facility. A waste paper dealer often will accept baled paper only if a low level of contamination can be guaranteed by the facility.

- Announcement of the educational sessions and a schedule of when they will be conducted.

Distribution of this memorandum should occur a few weeks prior to the education session, leaving sufficient time to ensure employee attendance and interest. Copies of the memo should be available for distribution throughout the course of the program. An example of a kick-off memo is presented in Exhibit 24.

Scheduling and Conducting the Education Sessions

The next step is to inform each worker about how the program will work. A schedule of the education sessions should accompany the kick-off memo. Attendance at the education sessions should be mandatory, and it is important that sessions are organized and scheduled to be as convenient as possible for all employees.

Employee education sessions should initiate recycling as a way of life. Once an employee has attended the session, (s)he immediately begins participating in the program. All other aspects of the employee education program including posters and other publicity materials, should be in place prior to the education sessions.

How sessions are scheduled will depend on the facility's management, size, and available meeting space. Many organizations already have procedures for conducting employee education activities. When scheduling sessions consider the following:

- Conduct sessions for management prior to distribution of the kick-off memo. Informed managers will be better able to communicate the importance of attendance to their subordinates.
- Educate program monitors, collection staff, and other personnel involved in program operations prior to the general office sessions. They must have a working knowledge of program mechanics before implementation.
- Arrange follow-up briefings for those employees who are unable to attend the initial sessions.
- Arrange sessions in mid-morning and mid-afternoon; avoid scheduling at lunch (unless employees are agreeable to "brown-bag" sessions), the beginning and end of

the day, and near holidays.

Education sessions should be no longer than 15 to 20 minutes, and should include a formal presentation and time for questions and answers. Include the following key elements in the formal presentation:

- A concise description of the program operation.
- Pictures or displays of all collection equipment.
- Detailed description of acceptable and non-acceptable items stressing the importance of keeping contaminants out of sorted paper.
- A description of the environmental benefits of paper recycling and the end products of the recycling process (tissue, recycled office

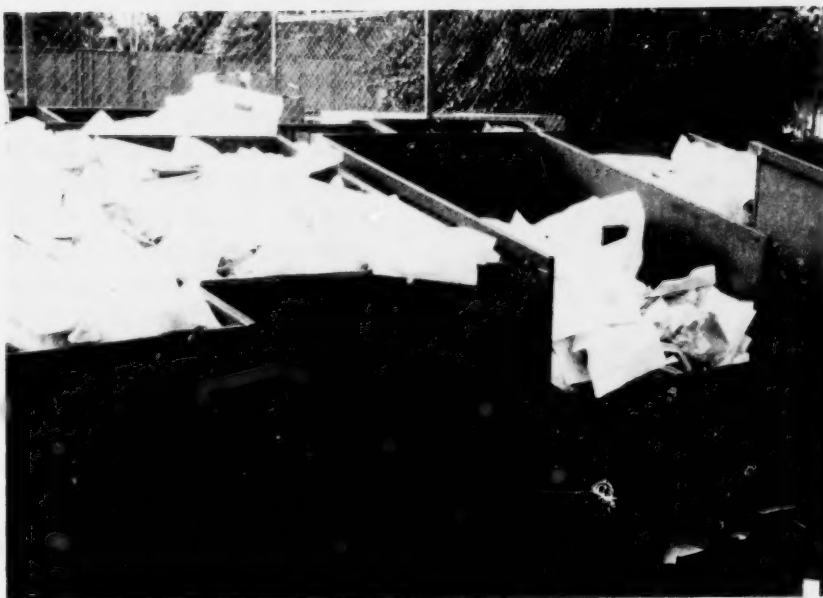


EXHIBIT 22

Paper can be stored in 3 cubic yard, roll away containers. Generation rate, collection schedule, and storage area will determine the type of storage containers best suited for a facility.

paper, etc.).

Slide shows or videos can be effective means to convey these key aspects of the program, along with posters and displays of acceptable and unacceptable items, and desk-top and central collection containers. Posters and flyers should appear several days before the first employee education session. Exhibit 25 is a poster that was used to announce the initiation of an office paper recycling program.

Desk-top containers should be distributed during or immediately following the education sessions. It is helpful to place a "how to" memo in the container highlighting the reasons for recycling and important features of the program, how it works, the types of acceptable paper, central container locations, and a telephone number to call in case of questions.

Employees should leave the session and begin recycling as soon as they return to their desks. New employees should receive the same information and handouts including their own desk-top container during orientation and/or training on their first day.

Developing or Procuring Publicity Materials

No successful program is without continual monitoring and reminders. Initial publicity materials such as posters and "how to" memos should be available at the time the education sessions are held. Publicity materials aimed at the employee should support and reinforce the information provided during the education sessions and should continually remind



EXHIBIT 23

Canvas bins on rollers can be used for collection, transportation to the storage area and as storage between collections by the waste paper dealer. The bins also can be stacked inside each other when not in use so that less space is utilized between collections.

employees of the program and the role they play in making it successful. Publicity tools include:

- Program logos and slogans.
- Posters.
- Newsletters and news articles.
- Brochures, leaflets, and memos.

A program logo or slogan can serve as the key unifying and identifying element in an office paper recovery program. A logo can be repeated on essentially all physical components in the program, including desk-top and central collection containers, posters, and other publicity materials. A series of items exhibiting a recycling program logo is presented in Exhibit 26.

Posters, as illustrated in Exhibit 27, designating acceptable and non-acceptable materials may be used to mark central container locations or just to announce and reinforce the program. Posters serve as strong visual reminders

TO: ALL ABC COMPANY EMPLOYEES
FROM: JANE DOE, PRESIDENT
DATE: MAY 24, 1989
SUBJECT: OFFICE PAPER RECYCLING AT ABC COMPANY

Studies show that each office worker throws away an average of a half-pound of recyclable paper every day. That's the equivalent of (X) tons a year from our office alone. This means that over (Y) trees and (Z) gallons of oil are needed each year just to keep our office afloat in paper.¹ We're starting a recycling program to put this paper to better use. By recycling, we'll lower our garbage disposal costs, earn revenue from the sale of our paper, and do our part to improve the environment.

Participation in this program will require only small changes in your daily habits. You will be given a desk-top container for storing white paper and computer paper. When your desk-top container is full, simply empty the contents into the central container nearest your desk. The locations of the central containers will be:

NEXT TO ALL OF THE COPY MACHINES;
ROOMS 200, 319, AND 452;
OUTSIDE THE COFFEE ROOM.

Please attend a short orientation session to learn more about how the program works. Three fifteen minute sessions have been scheduled for June 15, 1989. The sessions will start at 9:30 AM, 10:30 AM, and 1:30 PM. Your supervisor has a sign up sheet.

Your participation in this program does make a difference! For every piece of paper you recycle, you will:

- Protect the environment and save natural resources.
- Conserve scarce landfill space.
- Save money for our company.

If you have any questions about the program, please contact JOHN SMITH, at Extension 4635. Thanks for your cooperation.

¹ X = (# OF EMPLOYEES) x (0.5 LBS.) x (240 WORKING DAYS PER YR)/2,000 LBS.
Y = (17 trees) x (X tons of paper)
Z = (682.5 gallons of oil) x (X tons of paper)

Reference: Your Office Paper Recycling Guide. San Francisco Recycling Program.

EXHIBIT 24

A model for a typical kick-off memo for announcing an office paper recycling program.

and should be updated from time to time to reinforce participation in the program.

In-house or company newsletters, newspaper articles, brochures, memos, and notices also serve as constant reminders of program operation. They are effective tools in the initial and continuing education of employees. These communications convey changes in procedures or program progress/performance.

It may be desirable to publicize the paper recovery program in the local newspaper and/or the organization's newsletter. Such a measure improves public relations and boosts employee morale and support

of the program. Paper recycling can be a visible demonstration of the office "good neighbor policy". Unlike the Federal government, private businesses may be able to donate proceeds to local community groups or charities. Such efforts are well worth publicizing to the community and other interested parties.

Memos, newsletters, and brochures can be produced in-house or by outside services which specialize in production of posters, slide shows, or videos. Some publicity materials may be available through Federal, municipal, or private organizations. Both GSA and EPA are developing outreach materials to assist agencies in educating employees on recycling. If the recycling program is mandated through local or state legislation, then check with the overseeing agency regarding assistance to conduct the employee education campaign. Alternatively, check with local waste paper dealers or recycling consultants for available materials and program start-up services. In other words, use all the resources available to keep up the momentum and enthusiasm that has been established in the program.

Ongoing Publicity and Education

The publicity and education campaigns should be continuous. There must be immediate and sustained reinforcement of the changing habits required for recycling. It must be clear that the program is permanent and that it will work only through the cooperation of all participants. Ongoing publicity materials should highlight program accomplishments, contamination problems, program



EXHIBIT 25

To announce the education sessions that kick-off the recycling program, posters are placed throughout the office so that employees are notified.

modifications, and revenues that have been received from the sale of the paper. A continuing employee education program can assure increasing participation, while placing few demands on employees. Another aspect of ongoing education is new employee orientation. It is essential that new employees are well informed about the program through literature, handouts, orientation sessions, etc. (Exhibit 28).

CONTINUING PROGRAM OPERATION

Office paper recovery programs require continued administration on the part of building management and the program coordinator to sustain employee enthusiasm and cooperation. Ongoing

administrative aspects include:

- Stabilizing and monitoring program operations.
- Providing assistance as needed to employees.
- Coordinating with sales contractors.
- Recordkeeping of costs and revenues.
- Monitoring recovery rates and participation.
- Reporting successes and problems to management and employees.

Program start-up will identify problem areas, such as in distribution of con-



EXHIBIT 26

Logos and slogans can be reproduced on a multitude of items used every day so that the program is well publicized and there are constant visual reminders to recycle.

tainers or missed collections of central containers. The program coordinator will need to work closely with the collection staff to resolve any collection problems. It may be necessary to adjust collection frequencies, container locations, and collection routes. These and other trouble-shooting adjustments should be identified and resolved quickly by the coordinator. On an ongoing basis, the program coordinator should communicate specific problems or changes to the collection staff.

Program monitors should ensure that central container locations are kept neat and orderly and that central containers are



EXHIBIT 27

The poster above serves as a constant reminder for employees to recycle, lists the types of wastes to be placed in each receptacle, and clearly identifies which basket receives each type of waste.

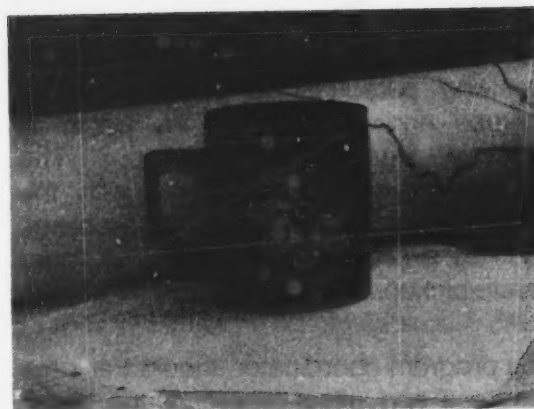


EXHIBIT 28

Educate new employees about the recycling program during their orientation. A coffee mug with the program's logo will welcome them into the program.

emptied regularly. In addition, monitors can screen containers for excess contaminants and answer employee questions. Monitors also may be instructed to routinely screen wastebaskets for the presence of recyclable paper and distribute reminders to those employees not participating in the program. A list of the program monitors will need to be updated as personnel changes occur and periodic training scheduled for newly appointed monitors.

The telephone number of the program coordinator and monitor should be listed in the office directory and distributed to employees. Employees should be encouraged to call to report overflows, ask questions, or request special assistance when they anticipate generating large amounts of paper. Extra containers can be made available for office clean-ups and other non-routine activities.

Open communication between the program coordinator and the waste paper dealer is another key element of program

operation. The program coordinator should work closely with shipping and receiving personnel to schedule paper pickups and ensure that the paper is properly organized for pickup. The coordinator should also work with the waste paper dealer to solve problems such as excessive downgrading of paper or late pickups.

The program coordinator should track the progress and effectiveness of the paper

recovery efforts by tabulating recovery rates, program operation costs, and revenues from the sale of paper. These records may provide information for ongoing publicity memos for employees, progress reports for management, and help to determine the average quantity of paper recovered per employee. All these help to portray the success of the program and generate further interest and compliance.

PROJECTING THE ECONOMICS OF PAPER RECOVERY

COST FACTORS IN PAPER RECOVERY

Office paper recovery can be economically successful! The cost effectiveness of a high-grade paper recovery program depends on three primary factors: avoided disposal costs due to reducing the present costs of waste disposal, proceeds from the sale of waste paper, and the costs of initiating and operating a recycling program. Although avoided costs of disposal and program operation costs are not always tracked separately for Federally-implemented paper recovery programs, some attention given to improving and managing these components will lead to more cost-effective recycling efforts.

Avoided Disposal Costs

One of the benefits of recycling is that waste disposal costs can be avoided since the waste is recycled rather than disposed. To assess avoided disposal costs related to recycling of paper wastes, first an estimate must be made of the quantities of high-grade paper expected to be removed from the total waste stream. Second, an evaluation must be made of the waste removal service pricing method. This might be structured as a flat fee per time period, a fee per "pull" (emptying of containers), or a fee per ton of waste hauled. The first two methods are the most common in large office buildings.

The quantity of high-grade paper that can be removed from the waste stream is

dependent upon the type of business involved. Typically financial and insurance institutions generate the greatest amounts of high-grade waste paper when compared to other institutions such as general office buildings. The most common types of high-grade paper are computer printout and white ledger.

The quantity of high-grade paper that will be recovered can be estimated by instituting a pilot recycling program, conducting a waste stream analysis, or simply making assumptions about waste paper generation rates per employee using data derived from other in-place recycling programs. Each of these methods was previously discussed in the section on the Feasibility Study.

The avoided disposal costs are the difference between your current disposal costs and the costs for disposing of only nonrecyclable wastes. Examine the current disposal contract and determine the costs of collecting/hauling the nonrecyclable waste. The waste hauler should be contacted to negotiate a reduction in hauling fees by changing the flat fee, the number of containers serviced, and/or the number of pulls needed.

The average monthly or yearly disposal costs may not be influenced by reduction in waste tonnage or volume due to recycling. For instance, facilities that dispose of bulk items such as wood pallets and corrugated boxes may not significantly reduce the volume of their waste without compacting. As a result,

the storage and collection frequency requirements would remain unchanged, even though the hauling weight would be reduced. In addition, disposal cost reductions may be precluded by:

- Existing contractual agreements with the hauler and/or pricing mechanisms that limit negotiating cost reductions based upon flow reductions.
- Leasing arrangements that prevent negotiating cost reductions in rented buildings where the lessor has the responsibility for disposal contracts.

In facilities studied by EPA in the 1970s, the disposal cost was reduced by about half the percentage that the waste stream was reduced. For example, if the weight of the waste stream was reduced by 40 percent after program implementation, a 20 percent reduction in disposal cost resulted. This relationship indicates the importance of tracking avoided disposal costs to support a paper recovery program.

Proceeds from the Sale of Waste Paper

The proceeds from the sale of waste paper depend upon the quantity of paper generated, the level of contamination, the transportation costs to get the product to the market, and the general state of the secondary paper market.

Current market prices for one ton of loose, unbaled high-grade paper can be obtained through industrial publications or local manufacturers that directly use recycled paper. The Fiber Market News

price quotes are for paper FOB (Free On Board - no shipping costs) at the facility loading dock. Mill Trade Journal quotes prices for paper FOB at the mill dock, whereas the price quoted in the Official Board Markets publication is FOB at the mill, baled and in boxcar loads (minimum amounts). In addition, local waste paper dealers can provide current prices for recycled high-grade paper specific to local conditions and transportation costs. An example of published mill prices for May 1989 is presented in Table 2. For all regions the price paid per ton for computer paper was 3 to 4 times higher than that paid for sorted white ledger. For both paper types the highest prices are paid in the West while dealers in the East, Mid-west, and South are receiving considerably lower prices for their waste paper.

Federal, state, and some local government agencies have procurement service branches such as GSA and DLA which already may have waste paper contracts in place in specific U.S. regions. These agencies should be contacted for current prices and relevant provisions of the contracts.

For most Federal agencies, collected waste paper is considered to be the property of the U.S. Government. Consequently, proceeds from the sale of recycled paper are deposited in the U.S. Treasury, as required by 40 USC Section 485(a), Federal Property Administrative Services Act of 1949. Thus, revenues derived from a specific Federal facility's program most often cannot be used to offset recycling program costs directly. (However, proposed Federal legislation may change this requirement and enable

individual Federal agencies to control these proceeds from recycling programs.) A few civilian agencies may be exempt from this requirement due to the way in which their funds have been appropriated. Program coordinators in Federal agencies should contact their general counsel and GSA to ensure that revenues are returned to the proper entity.

Proceeds from the sale of recyclables at the military department or department of defense are used for operational costs of the program. The balance exceeding operation and maintenance of the program is split evenly. Fifty percent goes towards energy conservation programs and occupational health and safety activities. The remaining proceeds are credited to a military welfare and morale account at the installation. Amounts in excess of \$2,000,000 per fiscal year are deposited in the Treasury. (U.S. Code Military Construction codification Act, Oct. 1, 1982, Title 10, Section 2577).

Costs of Implementing a Recycling Program

The costs for implementing a recycling program vary among programs and with time. Initially, a high-grade waste paper recycling program is likely to increase both administrative and custodial (or collection) labor, and costs for publicity, educational materials, containers, equipment, and perhaps, storage space. The largest administrative costs typically entail start-up costs that occur over the first several months. Once the program is in place and fine-tuned, then the administrative costs should decline and be limited to trouble-shooting the program on an as-needed basis.

Other costs required to initiate a program depend on the type of facility (size, complexity, and outlay) as well as the support and cooperation from management, employees, and out-of-house contractors (i.e., custodial services and

TABLE 2
MILL PRICES FOR HIGH-GRADE WASTE PAPER
(May 1989)

Region	PRICES (per ton)	
	Sorted White Ledger	Computer Printout
East	\$55-60	\$200-210
Mid-West	\$65-75	\$205-215
South	\$55-65	\$200-210
West	\$70-80	\$300-310

Source: Official Board Markets, 65 (19), May 13, 1989.

waste disposal services). Many of these cost components are listed in Table 3, along with estimates of requirements for program start-up and operation.

As an example, custodial labor requirements often can be met through an existing custodial service contract. Many Federal agencies have existing clauses in their contracts that require waste paper pickups. Alternatively, the existing custodial service contract may require revision. Estimated labor requirements for custodial services are given in Exhibit 29.

Purchases or capital outlays needed include containers for separating and collecting (and sometimes storing) the waste paper, and educational and publicity materials. Containers for the separation and collection of waste paper will need to be purchased commercially, entailing desk-top containers (at least one per employee) and central collection containers (about one per 20 employees). These containers can be obtained from office supply or custodial supply companies. The recycling contractor may also be able to supply central collection containers. Alternatively, some agencies design specific desk-top and central containers and request that manufacturers supply these units through a bidding process. Table 3 presents a range of estimated costs for desk-top and central containers obtained from all these sources.

Storage containers, depending on size desired or needed, range anywhere from under \$500 for a 4 cu. yd. front loader to more than \$3,000 for a 30 cu. yd. roll-off container. Because containers for storing

waste paper at a loading dock typically are provided by waste paper dealers, they were not included in the expenditure table.

Additional collection equipment may be needed, depending on the facility's requirements. Some waste paper dealers provide wheeled central storage containers to ease inter-facility transport to secondary containers, thereby reducing paper handling labor by eliminating transfers at the central storage area. Compactors or paper balers may need to be purchased or leased to reduce paper volumes if there is little available storage space to be acquired. Associated equipment might include pallets, forklifts, and roll-off containers, depending on the size of the program.

Storage space for containers may already be available at the loading dock, or additional space may need to be leased (or purchased) from the landlord or owner. Additional space requirements can be minimized by arranging for more frequent pickups by the recycling contractor.

Costs for educational and publicity materials (such as posters and labels for the containers) and memos or brochures to inform employees about the program can be minimized by in-house production of the items. Once a program is implemented, further use of low-cost newsletters or other news bulletins should be made to reduce publicity costs. The posters can be reissued every couple of years to revitalize interest in the program. Estimated costs for educational and publicity materials are given in Table 3.

TABLE 3

**ASSUMPTIONS USED IN ESTIMATING RATES, TIME, AND
EXPENDITURES ASSOCIATED WITH WASTE PAPER RECOVERY PROGRAMS**

A) Mixed High-Grade Paper Recovery	
General offices or offices w/o significant computer usage (assume computer printout generation is much less than for white ledger)	0.5 lbs/employee/day ⁽¹⁾
Banks and insurance companies or offices w/significant computer usage (assume computer printout generation is equal to or greater than that for white ledger)	1.0 lbs/employee/day ⁽²⁾
B) Percent Recovery	60 - 70% ⁽³⁾
C) Weight-to-Volume Conversion (for loose paper)	1 ton = 5 cu/yd non-compacted = 3 cu/yd compacted
D) Administrative Labor for the Recycling Coordinator	
1. Start-up labor (during months 1 & 2)	10 hrs/100 employees/month
2. Labor to maintain the program (for month 3 +)	2.25 hrs/100 employees/month
E) Custodial labor to pick up waste paper from central containers	8 hrs/100 employees/month ⁽⁴⁾

TABLE 3 (continued)

F) Containers.

1. Desktop containers	\$2/container/employee
paperboard/plastic file folder to upright	(\$1 - \$4)
2. Central containers w/lids	
20 gal. plastic	\$25/container/20 employees ⁽⁵⁾
32 gal. plastic	\$25/container/20 employees ⁽⁵⁾
44 gal. plastic	\$35-45/container/20 employees ⁽⁵⁾
36 gal. paperboard	\$4.50/container/20 employees ⁽⁵⁾

G) Publicity and Education

Posters (purchased)	\$25/poster/central container
Labels (purchased)	\$0.50/sticker/container
Memos/Brochures (produced in-house)	\$0.25/person

H) Life Period

Life of paperboard containers	5 years or less
Life of plastic containers	10 years
Life of educational materials	2 years

Notes:

- (1) This value is sensitive to the amount of computer printout generated and is assumed to be a conservative value.
- (2) With the advent of increased computerization, waste paper generation also has increased. This is a conservative value, e.g., utilities that are highly computerized have been shown to collect 1.7 lbs./employee/day. While it is common to collect computer printout and white ledger separately because of the higher value of computer printout, no breakdown is given here because it is highly facility-specific.
- (3) For use with waste stream analysis studies only. Values given in "A" already incorporate this assumption.
- (4) Refers to Exhibit 29. Labor Requirements for Collection of Recovered Paper.
- (5) Any combination will work; remembering that 20 people generating high-grade waste paper at a rate of 0.5 lb/day will fill a space equal to 25 gallons in one week.

COMPARISON OF SOLID WASTE DISPOSAL COSTS WITH AND WITHOUT RECYCLING

The cost effectiveness of implementing a high-grade waste paper recycling program can best be illustrated by comparing costs for solid waste disposal at a facility before recycling is implemented (current situation) versus after recycling is implemented (proposed situation). Typically, the comparison is estimated for one year due to lack of long-term fixed-price contracts for waste disposal and waste paper sales. Costs and computations should include capital expenditures and operation and maintenance (O&M) costs. In order to develop an annual cost for the upcoming year, capital expenditures are converted to annual costs by dividing each expenditure by the estimated useful life (number of years) of the capital item. Operation and maintenance costs normally are tracked as annual costs.

Table 4 is a worksheet used to aid in the computation of costs for solid waste disposal with or without recycling activities. The worksheet will help indicate potential savings gained after implementation of a paper recovery program. Items listed in the worksheet are monthly and annual O & M and capital costs laid out for program operations. To annualize a capital cost for an item, it must be divided by its expected life period (obtained from Table 3).

The only way that program success can be gauged economically, is through careful tracking of costs continually throughout the life of the program. Those values used in the Table 4 worksheet may only be ballpark figures, yet their usefulness in determining the feasibility of a paper recovery program should not be underestimated.

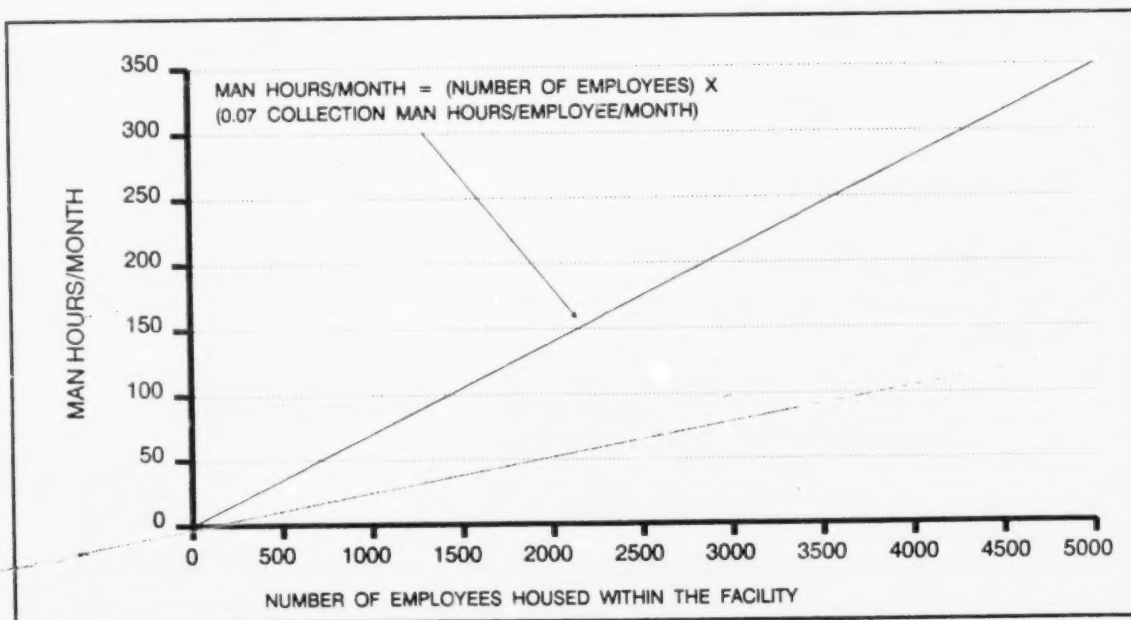


EXHIBIT 29
Labor requirements for collection of recovered paper.

TABLE 4

**WORKSHEET FOR COMPARISON OF SOLID WASTE
DISPOSAL COSTS WITH AND WITHOUT RECYCLING**

	<u>ANNUAL</u>
PRESENT DISPOSAL COSTS:	
Disposal	\$ _____
Equipment	+ \$ _____
Custodial Labor	+ \$ _____
Revenue From Any Current Recycling Program	- \$ _____
TOTAL	<u>\$ _____</u>
DISPOSAL COSTS AFTER IMPLEMENTATION:	
Disposal Costs for Reduced Waste Volume ¹	\$ _____
Labor - Administrative	+ \$ _____
Custodial	+ \$ _____
Equipment -	
Desk-top Containers	+ \$ _____
Central Containers	+ \$ _____
Storage, etc.	+ \$ _____
Publicity/Educational Information	
Posters	+ \$ _____
Labels	+ \$ _____
Brochures/Memos	+ \$ _____
SUBTOTAL	<u>\$ _____</u>
Waste Paper Sales Revenues ²	- \$ _____
Net Recycling Disposal Costs	<u>\$ _____</u>
SAVINGS:	
<u>Present Disposal Costs Total</u>	<u>Net Recycling Disposal Costs</u>
= <u>Net Savings (Costs)</u>	
¹ Determine the reduced waste volumes resulting from recycling and contact your waste disposal company to determine reduced costs. ² Contact waste paper dealers or consult market listings for the current value of your waste paper with or without pickup.	

ARRIVING AT SUCCESS AND BEYOND TO THE FUTURE PROGRAM

Through a concerted recycling effort the current solid waste crisis can be turned back before it worsens. Businesses and offices instituting high-grade waste paper collection programs can help reclaim a great deal of the 41 percent of solid waste made of paper. If each employee can be made to feel that they take part equally and enthusiastically in a greater program of social good, then a paper recovery program can successfully be accomplished. Key components of any program include:

- Management support.
- Designating a capable program coordinator.
- Effective program monitors.
- Conducting an effective employee publicity and education program.
- Developing and implementing a reliable collection system.
- Reliable storage and removal.
- Establishing an appropriate long-term marketing arrangement (i.e., a paper sales contract).
- Establish periodic program monitoring to quantitatively assess progress.

There are a plethora of reasons to implement a successful recycling program. Source separation and recycling of high-grade paper helps to conserve timber, water, and energy

resources with benefit to the economy and our nation's environment. Recycling reduces the solid waste quantities generated by office buildings and thus can reduce building management costs. High-grade paper recovery programs using the desk-top containers have demonstrated high levels of participation and help to educate employees about recycling. This education can have far reaching effects, since employees may start to recycle as part of their daily routine at home and pass on the message to family members and friends.

After the office paper recovery program is operating successfully, the organization can further increase its recycling efforts by instituting separation programs for beverage containers and other paper grades, for example. Office recycling programs can be more effective by increasing the office's use of materials and products that are recyclable rather than disposable. One method is to reduce the amount of non-recoverable paper (colored, coated, etc.) procured for use in the office. For example, in the District of Columbia, the Council of Governments is urging offices to avoid using non-recyclable yellow legal paper.

Promote waste reduction efforts in the office by encouraging employees to reduce their waste generation. Make double-sided copies, use the blank side of used paper as scratch paper, and circulate less in-house paper (by using

electronic mail communication or routing memos by department rather than distributing them to each employee).

Less waste can be generated through the purchase of more durable goods in lieu of disposals; refilling rather than replacing cartridges for printers; procurement of more supplies in bulk to avoid over-packaging, and purchase of surplus or second hand supplies, equipment, and furniture. In short, get everyone thinking "conservation".

Finally, recycling does not end with collection of recyclables. As illustrated in the three arrow recycling symbol, the system is continuous and the recycling process is complete only if manufacturers and consumers use and demand products made of recycled materials. Federal agencies and other organizations

should purchase products made from recycled paper. In many areas, Federal and state laws require and encourage procurement of recycled materials such as retreaded tires, recycled oil, etc. Purchasing recycled materials ensures that there is a demand for the paper collected through recycling programs.

Recycling, waste reduction, and purchasing recycled materials by Federal, state and other offices are important pieces in solving the solid waste puzzle. Implementing a successful office paper recycling program as outlined in this manual is one way for Federal and other offices to help meet our national goal of 25% recycling and reduction of waste and to set the tone for others to follow. By easing the landfill capacity dilemma we can help ourselves and preserve the future for coming generations.

CASE STUDY

EPA HEADQUARTERS, WASHINGTON, D.C.

This case study describes EPA's high-grade waste paper recovery program that was initiated in 1975 at the EPA headquarters at Waterside Mall, 401 M Street S.W., in Washington, D.C. A desk-top system was employed for separation and collection of waste paper.

The program was publicized through the slogan "Use it Again, Sam". This program was introduced to employees through memos and pamphlets (Exhibit 30). Black plastic desktop holders were distributed to each employee, and secondary collection containers (one per 20 employees) were placed throughout the office. The secondary containers were cardboard boxes (approximately 2' x 1.5' and 0.75' high) and were used for paper collection from nearby desk-top containers. Paper was collected from the cardboard containers by the custodial staff and stored at the loading dock in a central storage area. GSA's Office of Public Buildings and Real Property (OPR) and their Buildings Management Division, assigned and funded personnel to oversee the program while the GSA Federal Supply Service supervised the assigned personnel. From 1975 to 1978, an estimated 400 tons of high-grade paper was collected and recycled, generating a gross revenue of \$15,000.

In 1978, EPA shifted the responsibility for floor-to-floor waste paper collecting from their custodial contractors to their contract in-house movers, Trans-Continental, Inc.

In 1982, GSA initiated a program for implementing high-grade waste paper recovery at all Federal agencies in the National Capital Region. This program started with 28 targeted buildings but was later discontinued at most of the locations due in part to the declining value of waste paper. EPA (at Waterside Mall) and three other buildings housing Department of Agriculture offices continued the recovery program.

The collection of high-grade waste paper continued at a marginal level at EPA until about 1988. Problems cited in the program included the lack of active program management including employee education; contractor problems for waste pickups; difficulties in obtaining recycle boxes from the Federal Supply Service; and insufficient recordkeeping to track the economics of the program.

Recycling Work Group

In 1988, EPA sought to increase recycling of solid wastes. In February of that year, EPA established a "Recycling Work Group" to help the agency attain the goal of 75 percent recycling of agency white paper wastes by December 1989. The Work Group makes recommendations to EPA's Facilities Management Services Division which currently administers the high-grade waste paper collection program. Funding for the Work Group is through the budgets of the Office of Administration and Resources Man-



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

SUBJECT: PAPER RECYCLING AT WATERSIDE MALL
FROM: Russell E. Train
TO: All EPA Employees

Our Agency will soon initiate at Waterside Mall the first federal paper recycling program in the Washington, D.C. area. The object of this program is to recycle all the high-grade white and off-white wastepaper we generate at Waterside Mall. As you may know, EPA has proposed that all federal agencies recycle their high-grade wastepaper. We hope our program will serve as an example for these agencies. As we approach the Agency's fifth anniversary, it is significant that this program presents a rare opportunity for every individual to contribute personally and tangibly to a collectively significant environmental improvement effort.

By recycling our high-grade wastepaper, we can recover over half of all the waste that leaves EPA's buildings. A contract recently signed for sale of our paper will bring revenues of approximately \$50 per ton to the U.S. Treasury. This is in addition to the fact that recycling conserves energy and natural resources and protects our land from overburdens of waste.

The recycling program at Waterside Mall will be simple; only small changes in our daily habits are required. Each employee will have a desk-top container into which he or she will place white and off-white wastepaper. When the container is filled, about once a week, the employee will empty the accumulated paper into a designated box at conveniently located recycling stations on each floor. These stations will be clearly marked with our USE IT AGAIN, SAM slogan and will be located at a place which each employee frequents in the course of his or her normal business day.

A series of slide shows will be given to acquaint each employee with the program. A schedule of these will be distributed within the next two weeks. I urge each of you to attend. In addition to the slide shows, the Office of Solid Waste Management Programs will provide assistance as required.

Within the next week, program coordinators from that office will identify convenient recycling station locations and answer questions.

The success of this program depends upon everyone's cooperation.

EXHIBIT 30

The program kick-off memo used at EPA headquarters to introduce the paper recovery program.

agement and the Office of Solid Waste and Emergency Response.

Work Group initiatives conducted during 1988 and 1989 in conjunction with the high-grade waste paper recovery program include:

- Hiring one full-time employee to address in-house recycling programs at EPA and outreach to other Federal agencies.
- Designating one official recycling coordinator/monitor for each program office within EPA.
- Making spot checks at EPA offices in Waterside Mall; noting the absence of recycle boxes, distributing cards (see Exhibit 31) to each office reminding them that desk-top and secondary containers are available free of charge at the supply store, distributing recycling boxes, providing them with a

telephone number to call for paper pickup, and a contact for information requests on the program.

- Recommending that the Crystal City and Fairchild buildings housing EPA employees be included in the waste paper collection program in place at Waterside Mall.
- Conducting a one-week waste stream analysis to estimate the effectiveness of the paper recovery program and distributing a memo to employees reporting the results.
- Implementing a "friendly" administrative enforcement program whereby recycle reminders will be posted when spot visual checks reveal inadequate program participation at a given office (Exhibit 32).
- Including information about recycling into new employee orientation sessions.



U.S. Environmental Protection Agency Paper Recycling Program

- Desk Top Containers and Boxes are available *—FREE—* at the Supply Store (G-100)
- **FOR PAPER PICK-UP CALL 382-2140**
- For general information on the EPA Recycling Program

Call: _____

Look for Glass & Aluminum Recycling Programs Soon!

EXHIBIT 31

A 3x5 inch card was distributed to employees when an absence of recycling containers is noted.

- Placing signs over copiers urging two-sided copying.

In conjunction with these activities at EPA, GSA revised their high-grade waste paper pickup contracts in 1988 and 1989. The standard contract was changed to reflect a price consistent with the market value of the paper. The price-per-ton for high-grade waste paper (white ledger and computer paper) was increased from \$30 under the 1988 contract to \$80 under the 1989 contract.

Planned activities discussed during the Work Group meetings include the following:

- Replacing the secondary containers with a smaller size (i.e., 1.5' by 1.0' by 0.75').
- Conducting another waste stream analysis in 1989 to monitor the program's success.
- Increasing efforts for procurement of recycled paper products

EPA's WHITE PAPER RECYCLING PROGRAM

RECYCLE ALL	CURRENTLY NOT RECYCLABLE
White letterhead paper White photocopier paper White computer paper White bond paper (Staples need not be removed. Paperclips and binder clips must be removed before recycling.)	Newspapers Colored paper Paper wrapping from photocopier paper Adhesive labels Glossy and coated papers Cardboard ² Carbon paper ² Envelopes ² Binders and Folders ² Glued paper Thin recycled paper

² Although the EPA paper recycling program does not currently (July 1989) include these items, you are encouraged to reuse these items as much as possible.

Please note that glass jars and bottles, from home and work, can be dropped off for recycling at the Igloo containers located in the West Tower parking lot, M Street side.

RECYCLING REMINDER

Observations around this area revealed high-grade white paper in the trash can. The Agency is now striving to **recycle all of its high-grade white paper.**¹ Recycling saves energy, conserves natural resources, extends the life of landfills and reduces air and water pollution.

Please help promote EPA's commitment to recycling by putting **all** waste high-grade white paper (listed on reverse) in a designated box for recycling. If your office does not have a recycling box, or needs additional recycling boxes, these can be obtained at no charge from the EPA Supply Store. If your recycling box is full, please call 382-2140 for pickup. For more information on EPA's recycling efforts, you may call the individual listed on the reverse side who is a volunteer on the Agency's Recycling Workgroup. Thank you for your cooperation.

¹ Even though EPA Headquarters recycled approximately 253 tons of white paper in 1988, a waste stream analysis estimates that we still threw out 250 tons of recyclable white paper.



NAME _____

TELEPHONE _____

Printed on Recycled Paper

EXHIBIT 32

The above messages are printed each on one side of a card and hung on the doorknob of an employee's office if it appears they have been discarding recyclable material in the trash.

including letterhead, copy paper and business cards.

- Continuing efforts for recycling other materials (glass and aluminum) inside the EPA building.

In addition, the Work Group is expanding the high-grade paper recovery program to include bulk paper grades and newspapers in compliance with the District of Columbia's recycling mandate. Thus, EPA is purchasing desk-top and central collection containers for collecting various grades of paper. The Recycling Work Group and coordinator have stepped up employee education efforts and collection

frequencies to meet the needs of the expanding program.

Current Program Operations

Exhibit 33 illustrates the trends in monthly quantities of waste paper collected at EPA headquarters over the past three contracts (1986-87, 1987-88 and 1988-89). Each succeeding contract period surpassed the other in total quantity collected:

- 185.5 tons in 1986-87 at \$30.00/ton for white ledger for a total of \$5,565.

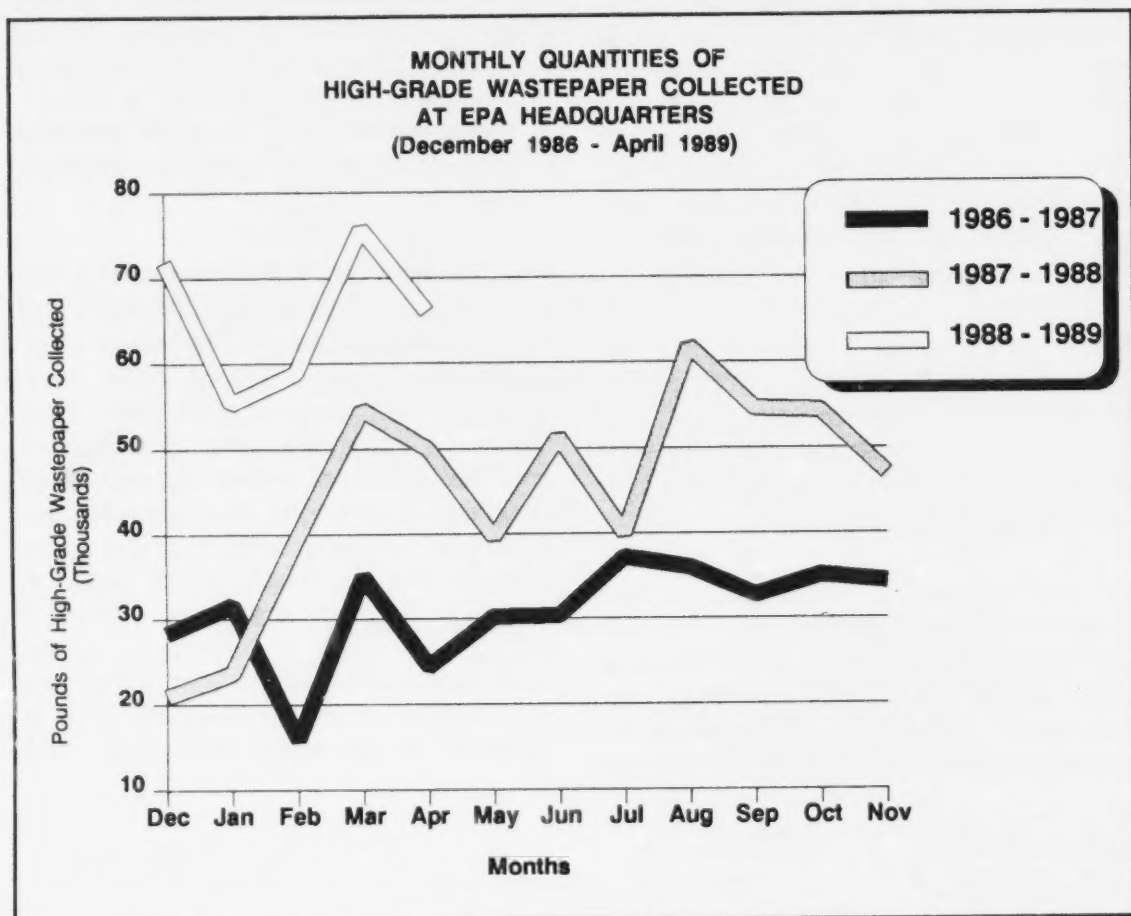


EXHIBIT 33

- 268.7 tons in 1987-88 at \$30.00/ton for white ledger for a total of \$8,061.
- 403 tons of high-grade paper at \$80.00/ton were collected during FY 1988-89 for a total of \$32,240.

The effectiveness of the program at EPA was evaluated in 1988 through a waste stream composition study by Franklin Associates Ltd. and NUS Corporation. The study entailed a one-week physical sampling of wastes generated in the three leased EPA buildings (Waterside Mall, Crystal City, and Fairchild). During the 1988 fiscal year, EPA collected and recycled about 269 tons of high-grade waste paper. A comparison of the survey results estimate that 250 tons of high-grade paper was disposed (not recovered) during the same time period. Thus, approximately 52 percent of the high-grade waste stream was recovered successfully. Approximately 6,600 EPA employees occupy the three buildings.

Estimates of waste generation rates for high-grade paper were made on the basis of the waste composition study and amounts of recoverable paper. The computations shown below indicate a rate of 0.66/pounds/employee/day.

Current operations (1989) for EPA's program involve a staff of three laborers that empty the secondary containers at each of the three EPA buildings, with subsequent transport and storage at the loading dock at Waterside Mall. (Fairchild

and Crystal City do not have adequate storage space.) Waterside Mall is serviced by this staff once per day. Fairchild is serviced twice per week and Crystal City is serviced once per week. Crystal City and Fairchild were added to the program in 1988. Collection of waste paper at these two facilities is limited to the use of 44-gallon plastic barrels at central locations in copy rooms.

Waste paper pickups by the GSA contractor are scheduled on an "as-needed" basis at Waterside Mall and usually occur at a rate of between 1-2 pickups per week. A telephone call one day in advance is required to arrange the pickup. A minimum of four filled central storage containers provided by the waste paper dealer are needed for a pickup. The central containers currently provided to EPA are large cardboard containers on pallets.

The operations staff at Waterside Mall has 10 central containers on hand to store and fill with recovered paper. The waste paper dealer fills out a delivery order form denoting the pickup location, date, truck number, number and type of containers and the grade of paper picked up, if attainable. A government representative signs and receives a copy of the order form as well as empty boxes equal in number to those removed. Within 24 hours, the truck is weighed by the contractor and the tare weight of the truck is subtracted from the weighed value to obtain the weight of the waste paper. This

$$\frac{(269 + 250 \text{ tons})}{1 \text{ year}} \times \frac{(2,000 \text{ lbs})}{\text{ton}} \times \frac{(1)}{6,600 \text{ employees}} \times \frac{(1 \text{ year})}{240 \text{ working days}}$$

$$= 0.66 \text{ pounds/employee/day}$$

figure is then reported to GSA and to EPA within 14 days of the pickup. Grade 1 paper as defined by EPA's GSA contract includes:

- Computer printout.
- White ledger.
- Hard white shaving.
- Manila tabulating cards.

Central collection containers must not contain greater than 1 percent unacceptable contaminants by weight. Acceptable contaminants are paper clips, staples, and soluble glues (i.e., bond envelope glue). Unacceptable contaminants include pressure-sensitive labels and tapes, plastic-window envelopes, rubberbands, brown/golden kraft envelopes, binders, paper fasteners, binder clips, plastic materials, and carbon paper. Contaminated loads are downgraded to Grade 3 and are priced at \$31/ton in the 1989 contract. Only minor contamination problems have occurred to date in the 1989 contract (less than two percent of the loads have been downgraded).

Waste paper containing classified or confidential material is shredded once per week and combined with the Grade 1 paper prior to being collected by the waste paper dealer. Other confidential materials may be shredded at individual locations within EPA headquarters and disposed with other solid waste materials.

The EPA headquarters' recycling program cannot be assessed in terms of its cost-effectiveness as related to the Agency's budget. The proceeds from the sale of waste paper (which is the property of the Federal government) are directed back into the U.S. Treasury [as specified in 40 USC Section 485(a) pursuant to the Federal Property and Administrative Services Act of 1949]. Also, the buildings in which EPA headquarters reside are leased to them and waste collection and disposal are included in the lease as a service provided by their lessor. Therefore, cost savings in terms of avoided disposal costs or proceeds from paper recovery cannot be tracked readily.

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Office Paper Recovery: An Implementation Manual, EPA Office of Solid Waste, 1977 (SW-571C).

Office Paper Recycling, Metro Service District, Portland, OR, 1987.

Setting Up An Office Paper Recycling Program, Community Environmental Council, Inc., Santa Barbara, CA, 1987.

"How to Recycle Waste Paper," American Paper Institute, Paper Recycling Committee, New York, NY.

Program Design and Implementation Procedures Report, Council on the Environment of New York City, New York, NY.

Your Office Paper Recycling Guide, The San Francisco Recycling Program, San Francisco, CA.

EPA'S MUNICIPAL SOLID WASTE AND RECYCLING PROGRAM:

The Solid Waste Dilemma: An Agenda for Action, EPA Office of Solid Waste, February 1989 (EPA/530-SW-019).

EPA RCRA/Superfund Hotline - 1 (800) 424-9346 or (202) 382-3000

RECYCLING OTHER MATERIALS IN THE OFFICE:

Guide for Preparing Commercial Solid Waste Reduction and Recycling Plans, OSCAR, Rhode Island Department of Environmental Management, Providence RI.

A Guide to Recycling Commercial Waste, New Jersey Department of Environmental Protection, Office of Recycling, Trenton, NJ.

OTHER MUNICIPAL WASTE AND RECYCLING PUBLICATIONS:

Bibliography of Municipal Solid Waste Management Alternatives, EPA Office of Solid Waste, August 1989 (EPA/530-SW-89-055).

PURCHASING RECYCLED MATERIALS:

"Building Markets for Recyclables - The Federal Paper Guideline," Waste Age, October 1988.

"Buying Recycled Paper: A Primer," Waste Age, July 1989.

EPA Procurement Hotline - (703) 941-4452 (for information and copies of all EPA procurement guidelines, including paper, retread tires, rerefined lubricating oils, and building insulation products).

APPENDIX A

**ENVIRONMENTAL PROTECTION AGENCY GUIDELINES
FOR SOURCE SEPARATION FOR MATERIALS RECOVERY
(40 CFR 246)**

ENVIRONMENTAL PROTECTION AGENCY GUIDELINES FOR SOURCE SEPARATION FOR MATERIALS RECOVERY

(40 CFR 246; 41 FR 16950, April 23, 1976; Effective May 24, 1976; Amended by
47 FR 36602, August 20, 1982)

Title 40—Protection of Environment CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

PART 246—SOURCE SEPARATION FOR MATERIALS RECOVERY GUIDELINES

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APPENDIX—RECOMMENDED BIBLIOGRAPHY

Authority: Secs. 1008 and 6004 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6907, 6964).

[Authority citation revised by 47 FR 36602, August 20, 1982]

Subpart A—General Provisions

§ 246.100 Scope.

(a) These guidelines are applicable to the source separation of residential, commercial, and institutional solid wastes. Explicitly excluded are mining, agricultural, and industrial solid wastes; hazardous wastes; sludges; construction and demolition wastes; infectious wastes; classified waste.

(b) The "Requirement" sections contained herein delineate minimum actions for Federal agencies for the recovery of resources from solid waste through source separation. Pursuant to Section 211 of the Solid Waste Disposal Act, as amended, and Executive Order 11752 Section 4(a), the "Requirement" sections of these guidelines are mandatory for all Federal agencies that generate solid waste. In addition, they are recommended to State, interstate, regional, and local governments for use in their activities.

(c) The "Recommended Procedures" sections are presented to suggest actions or preferred methods by which the objectives of the requirements can be realized. The "Recommended Procedures" are not mandatory for Federal agencies.

(d) The Environmental Protection Agency will render technical assistance in the form of sample cost analysis formats, sample bid specifications, implementation guidance documents and other guidance to Federal agencies when requested to do so, pursuant to Section 3(d)1 of Executive Order 11752.

(e) Within one year after the effective date of these guidelines, agencies shall make a final determination as to what actions shall be taken to adopt the requirements of these guidelines and shall, within two months of such determination, submit to the Administrator a schedule of such actions.

(f) Federal agencies that make the determination not to source separate as described in §§ 246.200-1, 246.201-1, and 246.202-1, for whatever reason, shall make available to the Administrator the analysis and rationale used in making that determination. The Administrator shall publish notice of the availability of this report to the general public in the Federal Register. The following are considered to be valid reasons for not source separating under individual facts and circumstances: inability to sell the recovered materials due to lack of market, and costs so unreasonably high as to render source separation for materials recovery economically impracticable.

(1) The following points are to be covered in the report:

(i) A description of alternative actions considered with emphasis on those alternatives which involve source separation for materials recovery.

(ii) A description of ongoing actions which will be continued and new actions taken or proposed. This statement should identify all agency facilities which will be affected by these actions including a brief description of how such facilities will be affected.

(iii) An analysis in support of the action chosen by the agency including technical data, market studies, and policy considerations used in arriving at such a determination.

In covering the points above, agencies should make every effort to present information succinctly in a form easily understood, but in sufficient detail so that the factors influencing the decision not to source separate for materials recovery are clear.

(2) The above report shall be submitted to the Administrator as soon as possible after a final agency determination has been made not to adopt the requirements of these guidelines, but in no case later than sixty days after such final determination. The Administrator will indicate to the agency his concurrence/nonconcurrence with the agency's decision, including his reason therefor.

(3) Implementation of actions that would preclude source separation for materials recovery shall be deferred, for sixty days where feasible, in order to give the Administrator an opportunity to receive, analyze and seek clarification of the above required report.

[Sec. 246.100(f)(3)]

(4) It is recommended that where the report required by § 246.100(f) concerns an action for which an Environmental Impact Statement (EIS) is required by the National Environmental Policy Act, that the report be circulated together with the EIS.

(g) [Removed]

[246.100(g) removed by 47 FR 36602, August 20, 1982]

(g) The report required under § 246.100(e) and (f) shall be made on forms to be prescribed by the Administrator by notice in the **Federal Register**.

[246.100(h) revised and redesignated as (g) by 47 FR 36602, August 20, 1982]

§ 246.101 Definitions.

As used in these guidelines:

(a) "Agricultural solid waste" means the solid waste that is generated by the rearing of animals, and the producing and harvesting of crops or trees.

(b) "Baler" means a machine used to compress solid wastes, primary materials, or recoverable materials, with or without binding, to a density or form which will support handling and transportation as a material unit rather than requiring a disposable or reusable container. This specifically excludes briquetters and stationary compaction equipment which is used to compact materials into disposable or reusable containers.

(c) "Bulk container" means a large container that can either be pulled or lifted mechanically onto a service vehicle or emptied mechanically into a service vehicle.

(d) "Classified Waste" means waste material that has been given security classification in accordance with 50 U.S.C. 401 and Executive Order 11652.

(e) "Collection" means the act of removing solid waste (or materials which have been separated for the purpose of recycling) from a central storage point.

(f) "Commercial establishment" means stores, offices, restaurants, warehouses and other non-manufacturing activities.

(g) "Commercial solid waste" means all types of solid wastes generated by stores, offices, restaurants, warehouses and other non-manufacturing activities, and non-processing wastes such as office and packing wastes generated at industrial facilities.

(h) "Construction and demolition waste" means the waste building materials, packaging, and rubble resulting from construction, remodeling, repair, and demolition operations on pavements, houses, commercial buildings and other structures.

(i) "Compartmentalized vehicle" means a collection vehicle which has two or more compartments for placement of solid wastes or recyclable materials. The compartments may be within the main truck body or on the outside of that body as in the form of metal racks.

(j) "Corrugated container waste" means discarded corrugated boxes.

(k) "Corrugated box" means a container for goods which is composed of an inner fluting of material (corrugating medium) and one or two outer liners of material (linerboard).

(l) "Federal facility" means any building, installation, structure, land, or public work owned by or leased to the Federal Government. Ships at sea, aircraft in the air, land forces on maneuvers, and other mobile facilities are not considered Federal facilities for the purpose of these guidelines. United States Government installations located on foreign soil or on land outside the jurisdiction of the United States Government are not considered Federal facilities for the purpose of these guidelines.

(m) "Food waste" means the organic residues generated by the handling, storage, sale, preparation, cooking, and serving of foods; commonly called garbage.

(n) "Generation" means the act or process of producing solid waste.

(o) "High-grade paper" means letterhead, dry copy papers, miscellaneous business forms, stationery, typing paper, tablet sheets, and computer printout paper and cards, commonly sold as "white ledger," "computer printout" and "tab card" grade by the wastepaper industry.

(p) "Industrial solid waste" means the solid waste generated by industrial processes and manufacturing.

(q) "Infectious waste" means: (1) Equipment, instruments, utensils, and fomites (any substance that may harbor or transmit pathogenic organisms) of a disposable nature from the rooms of patients who are suspected to have or have been diagnosed as having a communicable disease and must, therefore, be isolated as required by public health agencies; (2) laboratory wastes, such as pathological specimens (e.g. all tissues, specimens of blood elements, excreta, and secretions obtained from patients or laboratory animals) and disposable fomites attendant thereto; (3) surgical operating room pathologic specimens and disposable fomites attendant thereto and similar disposable materials from outpatient areas and emergency rooms.

(r) "Institutional solid waste" means solid wastes generated by educational, health care, correctional and other institutional facilities.

(s) "Mining wastes" means residues which result from the extraction of raw materials from the earth.

(t) "Post-consumer waste" (PCW) means a material or product that has served its intended use and has been discarded for disposal or recovery after passing through the hands of a final consumer.

(u) "Recoverable resources" means materials that still have useful physical, chemical, or biological properties after serving their original purpose and can, therefore, be reused or recycled for the same or other purposes.

(v) "Recovery" means the process of obtaining materials or energy resources from solid waste.

(w) "Recycled material" means a material that is used in place of a primary, raw or virgin material in manufacturing a product.

(x) "Recycling" means the process by which recovered materials are transformed into new products.

(y) "Residential solid waste" means the wastes generated by the normal ac-

tivities of households, including but not limited to, food wastes, rubbish, ashes, and bulky wastes.

(z) "Separate collection" means collecting recyclable materials which have been separated at the point of generation and keeping those materials separate from other collected solid waste in separate compartments of a single collection vehicle or through the use of separate collection vehicles.

(aa) "Sludge" means the accumulated semiliquid suspension of settled solids deposited from wastewaters or other fluids in tanks or basins. It does not include solid or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved material in irrigation return flows or other common water pollutants.

(bb) "Solid waste" means garbage, refuse, sludge, and other discarded solid materials, including solid waste materials resulting from industrial, commercial, and agricultural operations, and from community activities, but does not include solids or dissolved materials in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants. Unless specifically noted otherwise, the term "solid waste" as used in these guidelines shall not include mining, agricultural, and industrial solid wastes; hazardous wastes; sludges; construction and demolition wastes; and infectious wastes.

(cc) "Source separation" means the setting aside of recyclable materials at their point of generation by the generator.

(dd) "Specification" means a clear and accurate description of the technical requirements for materials, products or services, identifying the minimum requirements for quality and construction of materials and equipment necessary for an acceptable product. In general, specifications are in the form of written descriptions, drawings, prints, commercial designations, industry standards, and other descriptive references.

(ee) "Stationary compactor" means a powered machine which is designed to compact solid waste or recyclable materials, and which remains stationary when in operation.

(ff) "Storage" means the interim containment of solid waste after generation and prior to collection for ultimate recovery or disposal.

(gg) "Virgin material" means a raw material used in manufacturing that has been mined or harvested and has not as yet become a product.

Subpart B—Requirements and Recommended Procedures

§ 246.200 High-grade paper recovery.

§ 246.200-1 Requirements.

High-grade paper generated by office facilities of over 100 office workers shall be separated at the source of generation, separately collected, and sold for the purpose of recycling.

**§ 246.200-2 Recommended procedures:
High-grade paper recovery from
smaller offices.**

The recovery of high-grade paper generated by office facilities of less than 100 office workers should be investigated in conformance with the following recommended procedures and implemented where feasible.

**§ 246.200-3 Recommended procedures:
Market study.**

An investigation of markets should be made by the organization responsible for the sale of recyclable materials in each Federal agency and should include at a minimum:

(a) Identifying potential purchasers of the recovered paper through standard market research techniques;

(b) Directly contracting buyers, and determining the buyers' quality specifications, the exact types of paper to be recycled, potential transportation agreements and any minimum quantity criteria; and

(c) Determining the price that the buyer will pay for the recovered paper and the willingness of the buyer to sign a contract for purchase of the paper at a guaranteed minimum price.

**§ 246.200-4 Recommended procedures:
Levels of separation.**

A two-level separation is recommended for most facilities. This separation should consist of (a) high-grade wastepaper and (b) all other waste. Facilities that produce large enough quantities of waste computer paper and cards to make their separation into a separate category cost effective may choose to implement three levels of separation: (1) computer papers, (2) other high-grade papers, (3) all other wastes.

**§ 246.200-5 Recommended procedures:
Methods of separation and collection.**

(a) Systems designed to recover high grades of office paper at the source of generation, i.e., the desk, are the desk-top system, the two-wastebasket system, and the office centralized container system.

(b) With the desk-top system, recyclable paper is placed by the generator in a container on his desk, while other waste is placed in a wastebasket. With the two-wastebasket system, recyclable paper is placed by the generator in one desk-side wastebasket, and all other waste is placed in another. In the centralized container system, large containers for the collection of recyclables are placed in centralized locations within the office areas of the building. Nonrecyclable waste is placed in desk-side wastebaskets.

(c) The recommended system is the desk-top system because it is designed to maximize recovery of high value material in an economically feasible manner. While the two-wastebasket system and centralized container system have been implemented with success in isolated instances, data indicate that, on the whole, these systems have experienced high levels of contamination, low levels of participation, and low revenues. The desk-top system has been designed to minimize these problems.

(d) The precise method of separation and collection used to implement the desk-top system will depend upon such things as the physical layout of the individual facility, the ease of collection, and the projected cost effectiveness of using various methods. The recommended desk-top system is carried out in the following manner:

(1) Workers are to deposit high-grade paper into a desk-top tray or other small desk-top holder to be supplied by the agency. This holder should be designed in such a way as to prevent it holding contaminants, such as food or beverage containers.

(2) At the office worker's convenience or when the tray is filled, the worker carries the paper to a conveniently located bulk container within the office area. This large container should be located in an area the worker frequents in the normal course of business.

(3) In locations where computer cards and printouts are to be collected separately, the receptacle for these wastes should be near the computer terminal or in some other logical, centrally located place.

(4) Collection of the high-grade paper from the bulk containers in the office area should be performed by the janitorial or general maintenance service. The number of locations and the frequency of collection of these containers will be determined by office size and maintenance staff capacity.

(e) Mixed paper and some high-grade office papers have also been recovered for recycling by hand-picking in an individual building's trash room or at a centralized facility serving several buildings. With these hand-picking systems, recyclable waste is not separated at the source of generation, but is mixed with other waste in the usual manner and removed to a centralized location where recyclable paper is picked out of the mixed waste by hand. Facilities may choose to use this method of high-grade paper recovery if it is shown by analysis to be economically preferable to source separation.

**§ 246.200-6 Recommended procedures:
Storage.**

Among the alternatives for paper storage are on-site baling, the use of stationary compactors, or storage in corrugated boxes or normal waste containers. Stored paper should be protected from fire, inclement weather, theft, and vandalism.

**§ 246.200-7 Recommended procedures:
Transportation.**

Transportation to market may be supplied by the facility, by a private hauler, or by the purchaser. Collection of the recyclable paper should be on a regular, established schedule.

**§ 246.200-8 Recommended procedures:
Cost analysis.**

After potential markets have been located (but prior to initiation of formal bidding procedures), preliminary determinations of various separation methods, storage, and transportation costs have been made, and estimated tonnages of both recoverable high-grade paper and

residual solid waste have been established, an analysis should be conducted which compares the costs of the present waste collection and disposal system with the proposed segregated systems. At a minimum, the study should include all capital, operating and overhead costs and take into account credits for revenue from paper sales and savings from diverting recycled materials from disposal. Potential costs to upgrade collection and disposal practices to comply with EPA's Guidelines for the Storage and Collection of Residential, Commercial and Institutional Solid Wastes (40 CFR Part 243) and Thermal Processing and Land Disposal Guidelines (40 CFR Parts 240 and 241) should be included in the analysis. In formulating a separation system and evaluating its costs, every effort should be made to use janitorial and waste collection resources efficiently. This cost analysis should enable the facility to determine the most cost effective method of implementing the requirement of this part.

**§ 246.200-9 Recommended procedures:
Contracts.**

Formal bids should be requested for purchase of the recovered materials, such bids being solicited in conformance with bidding procedures established for the responsible agency. Contracts should include the buyer's quality specifications, quantity and transportation agreements, a guarantee that the material will be accepted for one year or more, and a guaranteed minimum purchase price.

**§ 246.200-10 Recommended procedures:
Public information and education.**

A well-organized and well-executed public information and education program explaining the justification, goals, methods and level of separation should be conducted to inform and motivate office personnel and secure their cooperation in separating their waste. This public information and education program should precede the program and continue on a regular basis for its duration.

§ 246.201 Residential materials recovery.

§ 246.201-1 Requirement.

Separation of used newspapers at the source of residential generation in conjunction with separate collection shall be carried out at all facilities in which more than 500 families reside, and the newspapers shall be sold for the purpose of recycling.

**§ 246.201-2 Recommended procedures:
Newsprint recovery from smaller residential facilities.**

The recovery of newsprint generated by residential facilities of less than 500 families should be investigated in conformance with the following recommended procedures and implemented where feasible.

**§ 246.201-3 Recommended procedures:
Glass, can, and mixed paper separation.**

In areas where markets are available, it is recommended that glass, cans, and mixed paper be separated at the source [Sec. 246.201-3]

of generation and separately collected for the purpose of recycling.

§ 246.201-4 Recommended procedures: Market study.

An investigation of markets should be made for each material by the organization responsible for sale of recyclable materials in each agency and should include at a minimum:

(a) Identifying potential purchasers of the recovered material through standard market research techniques.

(b) Directly contacting buyers and determining the buyers' quality specifications, potential transportation agreements and any minimum quantity criteria.

(c) Determining the prices that the buyer will pay for the recovered material and the willingness of the buyer to sign a contract for the purchase of the material at guaranteed minimum prices.

§ 246.201-5 Recommended procedures: Methods of separation and collection.

Following separation within the home, any of the following methods of collection may be used:

(a) Materials may be placed at the curbside by the resident and may be collected from each household using separate trucks or compartmentalized vehicles.

(b) For multi-family dwellings, separated materials may be placed in bulk containers located outside of the building and collected by trucks dispatched to collect recyclables.

(c) Collection stations may be set up at convenient locations to which residents bring recyclables. These stations should provide separate bulk containers for each item to be recycled. The size and type of container will depend on the volume and type of material collected, the method of transportation to be used in hauling the materials to market and the frequency of removal.

§ 246.201-6 Recommended procedures: Transportation to market.

Transportation to market may be supplied by the facility or the community generating the waste, by a private hauler, or by the purchaser.

§ 246.201-7 Recommended procedures: Cost analysis.

After potential markets have been located (but prior to initiation of formal bidding procedures), preliminary determinations of various separation methods, storage and transportation costs have been made, and estimated tonnages of both recoverable materials and residual solid waste have been established, an analysis should be conducted which compares the costs of the present waste collection and disposal system with the proposed segregated systems. At a minimum this study should include all capital, operating and overhead costs and take into account credits for revenue from paper sales and savings from diverting recycled materials from disposal. Potential costs to upgrade collection and disposal practices to comply with EPA's Guidelines for the Storage and Collection of Residential, Commercial and Institutional Solid Wastes (40 CFR Part 243)

and Thermal Processing and Land Disposal Guidelines (40 CFR Parts 240 and 241) should be included in the analysis. In formulating a separate collection system and evaluating its costs, every effort should be made to use idle equipment and underutilized collection manpower to reduce separate collection costs. This cost analysis should enable the facility to determine the most cost effective method of implementing the requirements of this part.

§ 246.201-8 Recommended procedures: Contracts.

Formal bids should be requested for purchase of the recovered materials, such bids being solicited in conformance with bidding procedures established for the responsible jurisdiction. Contract material will be accepted for one year or more should include the buyer's quality specifications, quantity and transportation agreements, a guarantee that the material and a guaranteed minimum purchase price.

§ 246.201-9 Recommended procedures: Public information and education.

A well organized and well executed public information and education program explaining the justification, goals, methods and level of separation should be conducted to inform and motivate householders and to secure their cooperation in separating their waste. This public information and education program should precede the program and continue on a regular basis for its duration.

§ 246.202 Corrugated container recovery.

§ 246.202-1 Requirement.

Any commercial establishment generating 10 or more tons of waste corrugated containers per month shall separately collect and sell this material for the purpose of recycling.

§ 246.202-2 Recommended procedures: Corrugated container recovery from smaller commercial facilities.

The recovery of corrugated containers from commercial facilities generating less than 10 tons per month should be investigated in conformance with the following recommended procedures and implemented where feasible.

§ 246.202-3 Recommended procedures: Market study.

An investigation of markets should be made by the organization responsible for sale of recyclable material in each Federal agency and should include at a minimum:

(a) Identifying potential purchasers of the recovered corrugated through standard market research techniques.

(b) Directly contacting buyers and determining the buyers' quality specifications, potential transportation agreements and any minimum quantity criteria.

(c) Determining the price that the buyer will pay for the recovered corrugated and the willingness of the buyer

to sign a contract for purchase of the paper at a guaranteed minimum price.

§ 246.202-4 Recommended procedures: Methods of separation and storage.

The method selected will depend upon such variables as the physical layout of the individual generating facility, the rate at which the corrugated accumulates, the storage capacity of the facility, and the projected cost-effectiveness of using the various methods. All of the following suggested modes of separation and storage presuppose that the corrugated boxes will be accumulated at a central location in the facility after their contents are removed and that the boxes are flattened.

(a) Balers of various sizes: corrugated boxes are placed in balers and compacted into bales. These bales may be stored inside or outside of the facility. The bales should be protected from fire, inclement weather, theft, and vandalism.

(b) Stationary compactors or bulk containers: corrugated boxes are placed in a stationary compactor or bulk containers outside of the facility. The containers should be protected from fire, inclement weather, theft and vandalism.

§ 246.202-5 Recommended procedures: Transportation.

Transportation to market may be supplied by either the facility, a private hauler or the purchaser. In facilities to which goods are delivered from a central warehouse, corrugated may be backhauled by delivery trucks to the central facility and baled there for delivery to a user.

§ 246.202-6 Recommended procedures: Cost analysis.

After potential markets have been identified (but prior to initiation of formal bidding), preliminary determinations of various separation methods, storage and transportation costs have been made, and estimated tonnages of both recoverable material and residual solid waste have been established, an analysis should be conducted which compares the costs of the present waste collection and disposal system with the proposed segregated systems. At a minimum, the study should include all capital, operating and overhead costs and take into account credits for revenue from paper sales and savings from diverting recycled materials from disposal. Potential costs to upgrade collection and disposal practices to comply with EPA's Guidelines for the Storage and Collection of Residential, Commercial and Institutional Solid Wastes (40 CFR Part 243) and Thermal Processing and Land Disposal Guidelines (40 CFR Parts 240 and 241) should be included in the analysis. This cost analysis should enable the facility to determine the most cost effective method of implementing these guidelines.

§ 246.202-7 Recommended procedures: Establishment of purchase contract.

Formal bids should be requested for purchase of the recovered materials, such bids being solicited in conformance with bidding procedures established for the responsible agency. Contracts should

include the buyer's quality specifications, transportation agreements, a guarantee that the material will be accepted for one year or more and a guaranteed minimum purchase price.

§ 246.203 Reevaluation.

§ 246.203-1 Requirement. [Removed]

[246.203-1 removed by 47 FR 36603, August 20, 1982]

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APPENDIX B

FEDERAL SUPPLY SERVICE BUREAU - GSA REGIONS "Surplus Sales Program"

REGION 3 WASHINGTON, DC OFFICE

GSA
Supply Distribution Facility (3FBPS-W)
6808 Loisdale Rd., Bldg. A
Franconia, VA 22150
COM - (703) 557-7785
FTS - 557-7785

District of Columbia; Montgomery
and Prince Georges Counties in
Maryland, Arlington, Fairfax,
Loudoun, and Prince William Counties
and Cities of Alexandria and Falls
Church in Virginia

REGION 1

GSA, Federal Supply Service Bureau
Personal Property Services (2FBP-1)
10 Causeway Street, 9th Floor
Boston, MA 02222-1076
COM - (617) 565-7316
FTS - 565-7316

Connecticut, Maine, Massachusetts,
New Hampshire, Rhode Island, and
Vermont

REGION 2

GSA,
Supply Distribution Facility (2FBP-S)
26 Federal Plaza, Room 20-116
New York, NY 10278
COM - (212) 264-2626
FTS - 264-2626

New Jersey, New York, Puerto Rico
and Virgin Islands

REGION 3

GSA
Supply Distribution Facility (3FBP-S)
Ninth and Market Streets
Philadelphia, PA 19107
COM - (215) 597-5671
FTS - 597-5671

Delaware, Maryland, Pennsylvania,
Virginia, and West Virginia (does
not include Washington, DC
Metropolitan Area - Region 3)

REGION 4

GSA, Supply Distribution Facility
75 Spring Street, SW
Atlanta, GA 30303
COM - (404) 331-0972
FTS - 331-0972

Alabama, Florida, Georgia, Kentucky,
Mississippi, North Carolina, South
Carolina, and Tennessee

GSA,
Supply Distribution Facility (5FBP-S)
230 South Dearborn Street, 34th Floor
Chicago, IL 60604
COM - (312) 353-6061
FTS - 353-6060

REGION 5

Illinois, Indiana, Michigan
Minnesota, Ohio, and Wisconsin

GSA,
Supply Distribution Facility (6FBP-S)
9001 State Line Road No. 308
Kansas City, MO 64114
COM - (816) 523-6955 or 7002
FTS - NONE

REGION 6

Iowa, Kansas, Missouri, and
Nebraska

GSA,
Supply Distribution Facility (7FPB-S)
819 Taylor Street
Fort Worth, TX 76102
COM - (817) 334-2351
FTS - 334-2351

REGION 7

Arkansas, Louisiana, New Mexico,
Oklahoma, and Texas

GSA
Supply Distribution Facility (8FPB-S)
Building 41, Denver Federal Center
Denver, CO 80225
COM - (303) 236-7705
FTS - 776-7705

REGION 8

Colorado, Montana, North Dakota,
South Dakota, Utah, and Wyoming

GSA,
Supply Distribution Facility (9FPB-S)
525 Market Street, 32nd Floor
San Francisco, CA 94105
COM - (415) 974-9189
FTS - 454-9189

REGION 9

Arizona, California, Hawaii,
Nevada, American Samoa, Commonwealth
of the Northern Marianas, Guam, and
Trust

GSA,
Supply Distribution Facility (10FPB-S)
GSA Center
Auburn, WA 98002
COM - (206) 931-7562
FTS - 396-7572

REGION 10

Alaska, Idaho, Oregon, and
Washington

APPENDIX C

WASTE COMPOSITION SAMPLING PROCEDURE

1. Separate a representative mixed waste sample of about 50 lbs. from a collection cart or storage bin placing it in a container of known volume and weight.
 2. Weigh the sample and estimate the volume (cubic feet or yards). Example:
 - o Estimated volume of the sample = 2.5 cu. ft. (0.09 cu. yd.).
 - o Gross sample weight 35.6 lbs.
 - o container weight 1.0 lbs.
 - o Net sample weight 34.6 lbs.
 3. Compute density (lbs./cu. yd.) by dividing net sample weight (lbs.) by estimated sample volume (cu. yds.):
 - o $34.6 \text{ lbs.} \div 0.09 \text{ cu. yds.} = 384 \text{ lbs./cu. yd.}$
 4. Divide the sample into components listed in the following waste generation and composition tally sheet, placing each material in a corrugated box or other container whose empty weight has been recorded.
 - o Weigh each box separately and subtract the container weight to obtain the net material weight.
 - o Compute the percentage of total weight represented by each material.
- These four steps should be repeated several times in order to develop valid density and composition averages.

Sample Weight 34.6 lbs. lb.		Total %
Paper		
White ledger	13.9	40.2
Colored ledger	1.1	3.3
Computer printout	3.6	10.6
Newsprint	4.3	12.5
Corrugated	1.9	5.6
Books	0.6	2.0
Cardboard files	0.8	2.5
Other mixed paper	3.2	9.6
Garbage	1.1	3.3
Metals and Glass	1.7	5.1
Textiles, Plastics and Wood	0.4	1.6
Special	1.3	3.8
TOTAL	34.6	100.1

5. Once the average density and composition are known, various conclusions can be drawn.
 - a. Multiplying the density by the cu. yd. disposed of each month yields an estimate of total monthly solid waste generation.
 - b. Using composition percentages, the total generation can be broken down into individual material groups to give an indication of the quantities of high-grade paper in the wastestream.

Compactor Capacity	Number Emptied Per Month	% Full When Emptied	Cu. Yds./ Month
40 cu. yd.	4	100%	160
$384 \text{ lbs./cu. yd.} \times 160 \text{ cu. yd./month} = 61,400 \text{ lbs./month or } 30.7 \text{ tons/month.}$			

Type of High-Grade Paper	Total Waste Generation	x	% of Paper in the Waste stream	=	Generation of Paper
White ledger	30.7 tons/mo	x	40.2%	=	12.3 tons/mo
Computer Printout	30.7 tons/mo	x	10.6%	=	3.2 tons/mo

APPENDIX D

PAPER GRADE DEFINITIONS

(42) Computer Printout: Consists of white sulphite or sulphate papers in forms manufactured for use in data processing machines. This grade may contain colored stripes and/or impact or non-impact (e.g., laser) computer printing, and may contain not more than 5% of groundwood in the packing. All stock must be untreated and uncoated.

Prohibitive materials..... None permitted
Total Outthrows may not exceed..... 2%

(40) Sorted White Ledger: Consists of printed or unprinted sheets, shavings, guillotined books, quire waste, and cuttings of white sulphite or sulphate ledger, bond, writing paper, and all other papers which have a similar fiber and filler content. This grade must be free of treated, coated, padded, or heavily printed stock.

Prohibitive materials..... None permitted
Total Outthrows may not exceed..... 2%

(30) Hard White Shavings: Consists of baled shavings or sheets of all untreated white bond ledger or writing papers. Must be free from printing and groundwood.

Prohibitive materials..... None permitted
Total Outthrows may not exceed..... 2%

(37) Manilla Tabulating Cards: Consists of manila-colored cards, predominantly sulphite or sulphate, which have been manufactured for use in tabulating machines. This grade may contain manila-colored tabulating cards with tinted margins.

Prohibitive materials..... None permitted
Total Outthrows may not exceed..... 2%

OUTTHROWS

The term "Outthrows" as used throughout this Appendix is defined as "all papers that are so manufactured or treated or are in such a form as to be unsuitable for consumption as the grade specified."

APPENDIX D (continued)

PROHIBITIVE MATERIALS

The term "Prohibitive materials" as used throughout this Appendix is defined as:

- Any materials which by their presence in a packing of paper stock, in excess of the amount allowed, will make the packaging unusable as the grade specified.
- Any materials that may be damaging to equipment.

Note: The maximum quantity of "Outthrows" indicated in connection with the following grade definitions is understood to be the TOTAL of "Outthrows" and "Prohibitive Materials."

A material can be classified as an "Outthrow" in one grade and as a "Prohibitive Material" in another grade. Carbon paper, for instance is "UNSUITABLE" in Mixed Paper and is, therefore, classified as an "Outthrow", whereas it is "UNUSABLE" in White Ledger and in this case classified as a "Prohibitive Material."